THE IRON AGE

New York, July 6, 1922

ESTABLISHED 1855 VOL. 110, No. 1

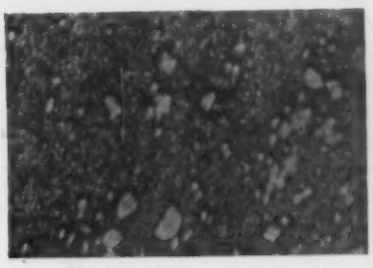
Physical Tests on High-Speed Steels

Transverse and Tenstile Tests of Two Grades Compared— Effect of These Properties on the Service of the Tool

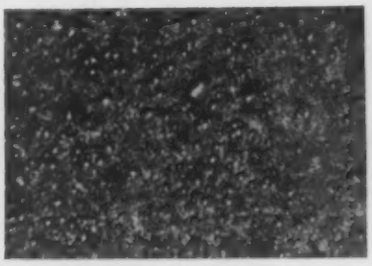
BY A. H. D'ARCAMBAL*

A RECENT search of the literature on high-speed steel showed that very little information had ever been published on the strength of high-speed steel given different heat treatments. Believing that such information was of sufficient value to merit work along these lines, the writer conducted a series of tensile and transverse tests on the two classes of high-speed steel finding the widest use in this country, namely, the 18 per cent tungsten, 1 per cent vanadium-

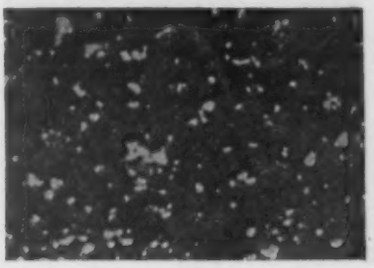
*Chief metallurgist Pratt & Whitney Co., Hartford, Conn.



Annealed Condition; Longitudinal Section

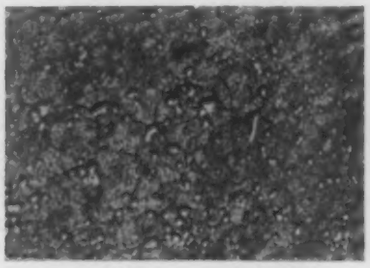


2100 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section

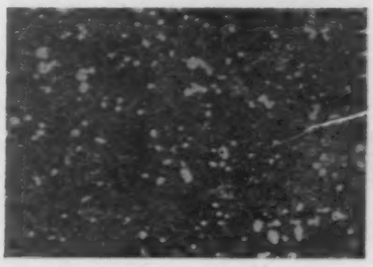


2100 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section

2500 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section

2350 Deg. Fahr.; Quenched in Lead at 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section

2350 Deg. Fahr.; Quenched in Lead at 1100 Deg. Fahr.; Air Cooled; Then Drawn to 1100 Deg. Fahr.; Cross Section

2350 Deg. Fahr.; Quenched in Oil Until Specimen Was Cooled to About 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section

Fig. 1.—Photomicrographs on Grade A Transverse Series Reduced About One-Fifth from an Original of 500 Diameters. Samples etched for 3 minutes in 5 per cent nital

Composition of the Steel: Carbon, 0.63; Chromium, 3.55; Vanadium, 0.97, and Tungsten, 17.04 Per Cent

type and the 14 per cent tungsten, 2 per cent vanadium grade.

Transverse Tests

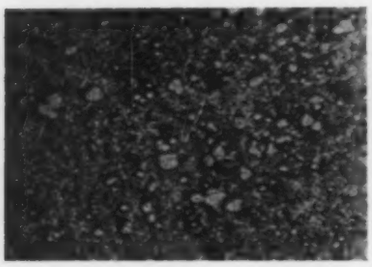
Hot rolled and annealed bars ¾ in. round were used for the transverse specimens, the analysis of the material running as follows:

	Grade A Per Cent	Grade B Per Cent
Carbon	0.63	0.65
Chromium	3.55	3.33
Vanadium	0.97	1.78
Tungsten	17.04	13.85

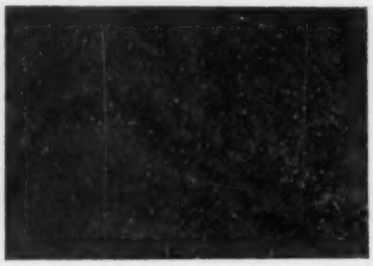
These bars were cut into seven inch lengths, centered, and turned to 11/16 in. in diameter. They were given the different heat treatments shown in Table I, then carefully ground to 21/32 in. The transverse figures obtained on these different specimens are shown in Table I and the photomicrographs in Figs. 1 and 2. The fractures were also examined, and it was noted that on the specimens of grade B steel quenched from 2350 deg. Fahr. they showed a slight coarsening of the grain; the fractures on the grade B samples quenched from 2100 deg. Fahr. and all of the grade A specimens possessing a velvety appearance. All of these transverse samples were also tested for hardness, using flat temper testing Nicholson XF files. The only specimens too soft to the file were the samples of grade A and grade B steels quenched from 2100 deg. Fahr. and given the 1100 deg. Fahr. draw. One is led to draw the following conclusions from these tests:

1.—The heat treatment which produced the greatest fiber stress, together with the requisite hardness, was that of quenching from 2350 deg. Fahr. in the lead bath at 1100 deg. Fahr., cooling to room temperature and drawing to 1100 deg. Fahr. Quenching from the high temperature in an oil bath, and drawing to 1100 deg. Fahr., gave almost as high results as the specimens quenched in the lead bath and given the high draw. On tests conducted several months ago, transverse specimens made from high-speed steel similar in analysis to grade A steel, were quenched from 2300 deg. Fahr. in oil and drawn to 1100 deg. Fahr. These specimens gave a fiber stress of 550,000 lb. per sq. in., two and one-half times the strength of the samples from the same bar quenched from the same temperature, but drawn to 450 deg. Fahr. only. I believe that if the A steel specimens, quenched from 2350 deg. Fahr., had been drawn to 1150 to 1175 deg. Fahr., the fiber stress figures obtained would have compared quite favorably with the samples given the 2300 to 1100 treatment. This higher drawing treatment would also have produced the requisite hardness because of the higher quenching temperature (2350 deg. Fahr.).

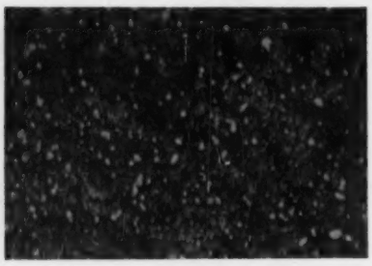
2.—Specimens of grade A steel, quenched from 2350 deg. Fahr. in oil and not drawn and samples quenched from the same temperature in the lead bath at 1100 deg. Fahr., air cooled and not drawn, showed a fiber stress of only a little more than one-half that of specimens given the same quenching treatment but drawn to 1100 deg. Fahr. Some of the undrawn specimens developed small cracks after grinding, due to the strains in the material. Every specimen made from grade B steel, and quenched from 2350 deg. Fahr. in oil or lead and not drawn, developed so many grinding cracks that they could not be tested. The undrawn specimens of both grades of steel were ground with the utmost care, for from tests conducted in the past, we discovered that the specimens given the high quenching temperature (2300 deg. Fahr.) and not drawn all cracked in grinding. It was impossible, however, to grind all of the undrawn specimens from grade A steel without cracking a few, and we were not able to obtain an undrawn specimen of grade B steel



Annealed Condition; Longitudinal Section



2100 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section

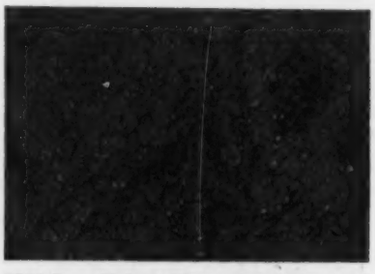


2100 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section

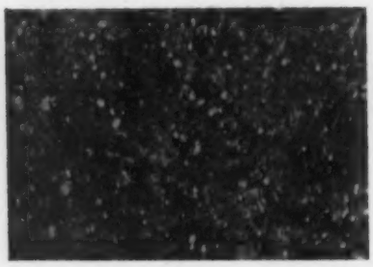
2350 Deg. Fahr.; Oil Quenched; Not Drawn; Cross Section

Fig. 2.—Photomicrographs on Grade B Transverse Series, Reduced About One-Fifth from an Original of 500 Diameters. Samples etched for 3 minutes in 5 per cent nital

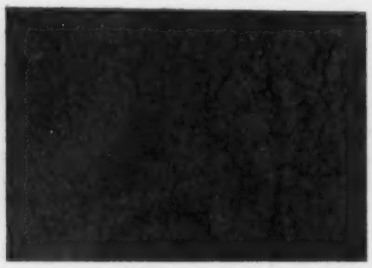
Composition of the steel: Carbon, 0.65; chromium, 3.33; vanadium, 1.78, and tungsten, 13.85 per cent.



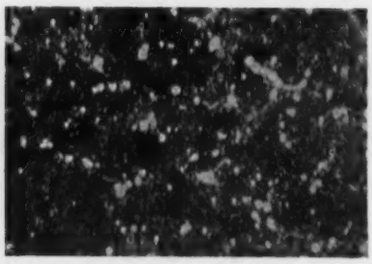
2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Quenched into Lead at 1100 Deg. Fahr.; Then Air Cooled; Not Drawn; Cross Section

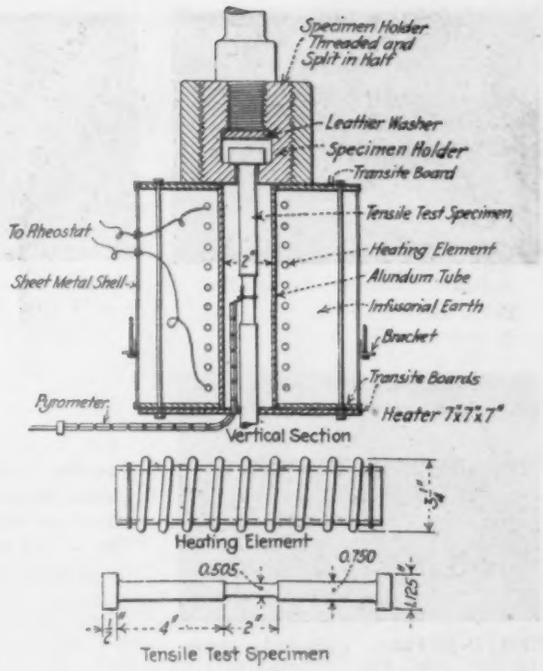


2350 Deg. Fahr.; Quenched into Lead at 1100 Deg. Fahr.; Air Cooled; Then Drawn to 1100 Deg. Fahr.; Cross Section

that was not full of grinding cracks. This high-drawing treatment, therefore, not only produces about double the transverse strength over that of undrawn specimens, but also gives a greater factor of safety in grinding.

3.—Grade B specimens quenched from 2350 deg. Fahr. and drawn to 450 deg. Fahr. and 1100 deg. Fahr., did not possess as high a transverse strength as grade A specimens given the same hardening treatments. It would appear that grade B steel does not stand as high a quenching temperature as grade A steel, for the fracture on the grade B specimens, quenched from the high temperature, showed a slight coarsening of the grain. I believe that grade B specimens quenched from 2300 deg. Fahr. and drawn to 1100 deg. Fahr. would show at least as great a strength as grade A specimens given the 2350 to 1100 treatment.

4.—The micrographs, Figs. 1 and 2, showed that the material as received in the annealed condition was satisfactory. Specimens of both grades of steel quenched from 2100 deg. Fahr. and not drawn possessed a fine grained martensitic structure with free carbides and tungstides. Drawing to 1100 deg. Fahr. produced a small amount of troostite with its corresponding softness. Specimens of both types of steel quenched from 2350 deg. Fahr. in oil or lead and not drawn possessed the polyhedral structure of austenite with only a few undissolved carbides and tungstides. Drawing to 450 deg. Fahr., in case of the A grade, left only a trace of the polyhedral structure, while the B specimens still showed the well developed grain. It would thus seem that the B type of steel requires a higher drawing temperature to produce the same changes in microstructure than is required by the A grade. It is also interesting to note the extremely low fiber stress on the B grade drawn to 450 deg. Fahr. in comparison with the A grade given the same heat treatment. Photomicrographs of both grades of steel, drawn to 1100 deg. Fahr., showed a complete disappearance of the polyhedral structure of austenite, and the development of a full martensitic structure. This structure is the most desirable one, for material possessing this microstructure has the greatest strength, proper hardness, and greatest degree of red hardness.



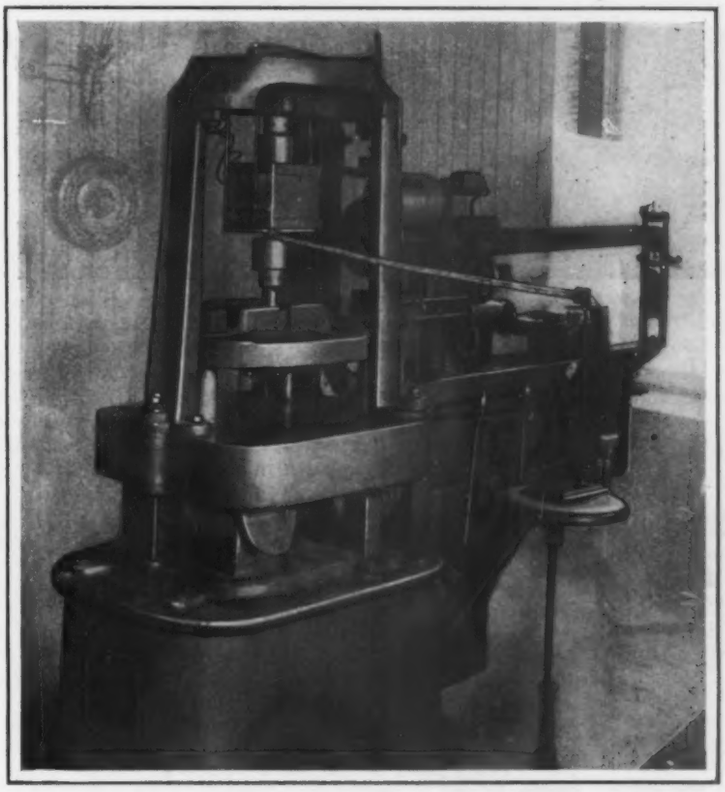


Fig. 3 (Above).—Electric Heater and Test Specimen. Heating element contains 2 coils each containing 56 ft. of No. 22 chromel A wire, connected in parallel, wound around an alundum tube, then covered with alundum cement

Fig. 4 (Left).—Electric Heater in Position on a Standard Testing Machine

Fig. 5 (Below.)—Tensile Test Curves. All specimens were quenched in oil from 2350 deg. Fahr. and drawn to 1100 deg. Fahr. before being tested. Additional tensile tests were:

Grade A High-Speed Steel

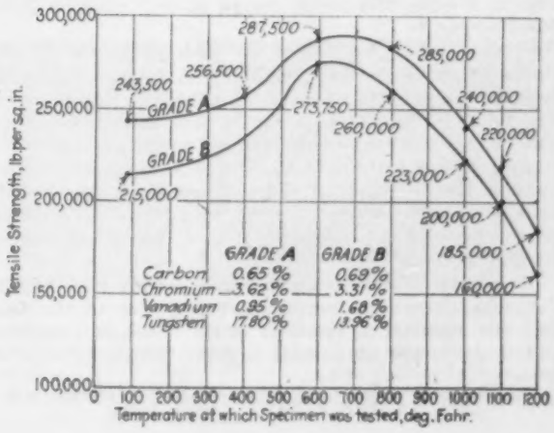
Heat Treatment, Deg. Fahr.	Temp. at Which Tested, Deg. Fahr.	Tensile Strength, Lb. per Sq. In.
2350, oil quenched, not drawn	Room temp.	175,000
2350, oil quenched, not drawn	800	272,000
2350, oil quenched, not drawn	1100	225,000
2350, oil quenched, 450 deg. drawn	Room temp.	185,000

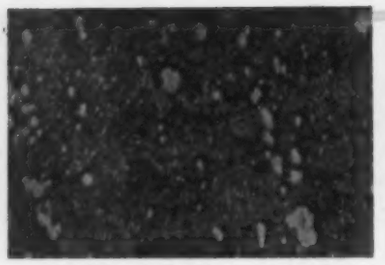
Carbon Tool Steel

1460, brine quenched, 400 deg. drawn	Room temp.	183,500
1460, brine quenched, 400 deg. drawn	1100	65,000

Tensile Tests

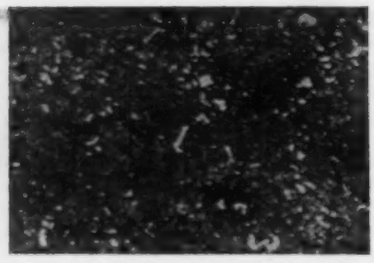
Hot rolled and annealed bars of high-speed steel





Annealed Condition; Longitudinal Section

2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at Room Temperature; Cross Section

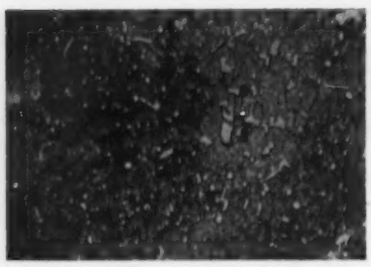


2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 600 Deg. Fahr.; Cross Section

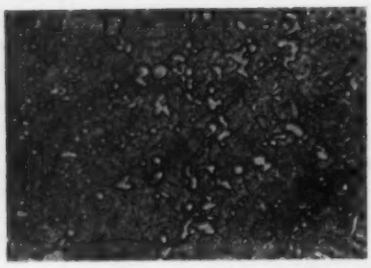
2350 Deg. Fahr.; Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1100 Deg. Fahr.; Cross Section

Fig. 6. — Photomicrographs on Tensile Test Series, Grade A Steel, Reduced About One-Fifth from an Original of 500 Diameters. All specimens etched for 3 minutes in 5 per cent nital

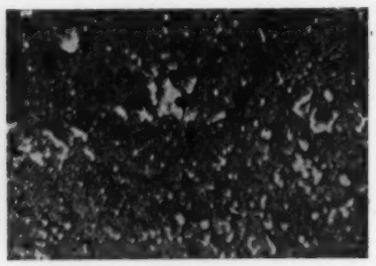
2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1200 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Drawn to 450 Deg. Fahr.; Tested at Room Temperature; Cross Section



2350 Deg. Fahr.; Oil Quenched; Not Drawn; Tested at 800 Deg. Fahr.; Cross Section



2350 Deg. Fahr.; Oil Quenched; Not Drawn; Tested at 1100 Deg. Fahr.; Cross Section

1 3/16 in., were obtained for the tensile test specimens. These bars analyzed as follows:

	Grade A Per Cent	Grade B Per Cent
Carbon	0.65	0.69
Chromium	3.62	3.31
Vanadium	0.95	1.68
Tungsten	17.80	13.96

The test specimens were made with shoulders instead of threaded ends, for past experience had shown that it was impossible to obtain accurate tensile test results on hardened high speed steel with the standard United States threaded end test pieces, due to the specimens usually failing in the threads.

A large number of these specimens were to be tested at elevated temperatures, so the test specimens were made 11 in. in length in order to allow a sufficient length on each end of the test specimen to extend through the electric heater so as to fit into the especially designed holders. The electric heater, shown in Fig. 3, is quite similar in design to that used by R. S. MacPherran.*

Fig. 4 shows the heater in position on the Tinius Olsen universal testing machine. All specimens were held at temperature for 30 min. before being tested. The results obtained with the various heat treatments, and at the different temperatures tested are shown in Fig. 5. The fractures of the grade A specimens pulled at room temperature all had the usual velvety appearance, but the fractures of the specimens made from grade B steel all showed a coarse, fairly crystalline structure.

I believe that this coarseness was due not only to the high quenching temperature but also to the fact that the material as received in the annealed condition had large lumps of carbide present, which, of course, would not go into solution upon hardening (See Fig. 7). The fractures on the specimens tested at temperatures higher than room temperature presented an interesting range of colors, as is shown in the following chart:

Fracture Colors

Deg. Fahr. at Which Specimen Was Tested	Grade A Steel Color	Grade B Steel Color
Room temp.	Steel gray	Steel gray
400	Steel gray	Steel gray
600	Very dark gray	Very dark gray
800	Chocolate brown	Medium brown
1000	Dark blue	Dark blue
1100	Greenish blue	Greenish blue
1200	Dull purple	Brownish purple

These specimens, after being pulled, were also tested with the flat temper testing files, all of these pieces being hard to the file with the exception of the grade A and B specimens tested at 1200 deg. Fahr., these being filed with difficulty, and the grade A specimens quenched from 2350 deg. Fahr., not drawn, and tested at 800 deg. Fahr. test. The specimens which were drawn to 1100 deg. Fahr., before being tested were file hard after each temperature tested from room temperature to 1100 deg. Fahr.

This illustrates another advantage of the high drawing treatment, for tools in service which have not been drawn quite often attain a temperature of 600 to 1000 deg. Fahr. These tools will, therefore, be very soft, after being cooled to room temperature in comparison with their original hardness, whereas tools drawn to 1100 to 1150 deg. Fahr. before being placed into service will maintain their hardness when cooled to room temperature from any temperature up to the original drawing heat.

Photomicrographs were taken from some of these tensile test specimens and are shown in Figs. 6 and 7. As stated in a previous part of this article, the micro-

*"Comparative Tests of Steel at High Temperatures," R. S. MacPherran, A. S. T. M. 1921 proceedings.

structure of the grade B steel was in a very unfavorable condition as received, due to the presence of large carbide lumps. The structure on the grade A material as received is satisfactory. Specimens drawn to 1100 deg. Fahr. after quenching, and then tested at elevated temperatures, showed the same microstructures as samples given the same treatment but tested at room temperature. This is to be expected for a temperature higher than the original drawing temperature must be exceeded before the martensitic matrix is changed into troostite.

Photomicrographs of the samples of carbon tool steel tested at room temperature and 1100 deg. Fahr. are also shown in Fig. 7. The sample tested at room temperature shows a martensitic matrix with free cementite present, while the samples tested at 1100 deg. Fahr. show a sorbitic matrix with a large amount of free cementite present.

Referring again to Fig. 5, we note that both grades of steel attained their maximum tensile strength at 600 deg. Fahr. The slope of the curve would indicate that the maximum physical properties would have been reached at around 700 deg. Fahr. Unfortunately, we did not have sufficient specimens to run tests at temperatures between 600 and 800 deg. Fahr. Hardened high-speed steel therefore gives the same characteristic curves when tested at elevated temperatures as do plain carbon and alloy steels. The grade B specimens gave lower reading than the type A samples, as would be expected from an examination of the fractures. I believe that drawing specimens of both grades of steel to 1150 to 1175 deg. Fahr., would have produced higher tensile strengths, without sacrificing the hardness to any extent.

Grade A test specimens quenched from 2350 deg. Fahr. and not drawn showed a tensile strength of only 175,000 lb. per sq. in., about 70 per cent of the value obtained on specimens quenched from 2350 deg. Fahr. and drawn to 1100 deg. Fahr. Specimens drawn to 450 deg. Fahr. after being quenched from the high temperature, showed a tensile strength of 185,000 lb. per sq. in. Very little increase in strength is obtained by drawing to only 450 deg. Fahr. Carbon tool steel, given its usual heat treatment, gave a tensile strength of 183,500 lb. per sq. in., tested at room temperature, and 65,000 lb. per sq. in., tested at 1100 deg. Fahr. Carbon tool steel shows a higher tensile strength at room temperature than high-speed steel quenched from 2350 deg. Fahr. and not drawn.

All of the high-speed test specimens were measured for elongation and reduction of area and none was obtained, even on samples pulled at the high temperatures. Hardened high-speed steel therefore possesses zero ductility, even when tested at a red heat.

The following precautions were taken in conducting these tests:

Table I—Transverse Tests of High-Speed Steel

ANALYSIS OF MATERIAL USED

	Grade A Per Cent	Grade B Per Cent
Carbon	0.63	0.65
Chromium	3.55	3.33
Vanadium	0.97	1.78
Tungsten	17.04	13.85

Specimens 0.656 in. in diameter x 7 in. long

Heat Treatment	Approximate Fiber Stress Grade A Lb. per Sq. In.	Approximate Fiber Stress Grade B Lb. per Sq. In.
2100 deg. Fahr. Oil quenched; not drawn	302,000	330,000
2100 deg. Fahr. Oil quenched; drawn to 1100 deg. Fahr.	460,000	520,000
2350 deg. Fahr. Oil quenched; not drawn	250,000†	*
2350 deg. Fahr. Oil quenched; drawn to 450 deg. Fahr.	308,000	222,000
2350 deg. Fahr. Oil quenched; drawn to 1100 deg. Fahr.	401,000	378,000
2350 deg. Fahr. Quenched in lead at 1100 deg. Fahr.; then air cooled; not drawn	243,000	*
2350 deg. Fahr. Quenched in lead at 1100 deg. Fahr; air cooled; then drawn to 1100 deg. Fahr.	432,000	396,000
2350 deg. Fahr. Quenched in oil until specimen was cooled to about 1100 deg. Fahr.; then air cooled; not drawn	243,000‡	

*Full of grinding cracks, so not tested.

†Few small grinding cracks present.

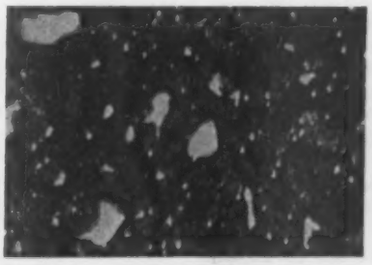
‡Few small grinding cracks present in one of the specimens.

The specimens were all time hardened, so as to insure the heat treatment being a constant.

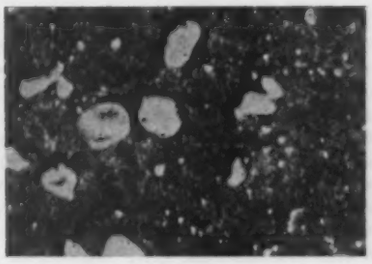
All pyrometers were carefully calibrated before being used. The accuracy of the testing machine was determined.

The writer does not wish to convey the impression that the physical strength of high-speed steel is an indication of its cutting qualities, but does believe that tools possessing the proper analysis, hardness and red hardness, together with the highest possible physical strength, will give the most satisfactory service.

Annealed Condition; Longitudinal Section

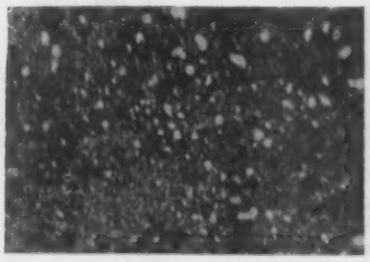


2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at Room Temperature; Cross Section

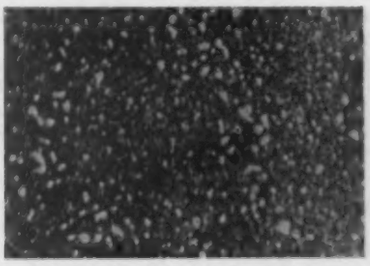


2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 600 Deg. Fahr.; Cross Section

2350 Deg. Fahr.; Oil Quenched; Drawn to 1100 Deg. Fahr.; Tested at 1200 Deg. Fahr.; Cross Section



Carbon Tool Steel: 1440 Deg. Fahr.; Brine Quenched; Drawn to 400 Deg. Fahr.; Tested at Room Temperature; Cross Section



Carbon Tool Steel: 1440 Deg. Fahr.; Brine Quenched; Drawn to 400 Deg. Fahr.; Tested at 1100 Deg. Fahr.; Cross Section

Fig. 7.—Photomicrographs in Tensile Test Series, Grade B Steel, Reduced About One-Fifth from an Original of 500 Diameters. All specimens etched 3 minutes in 5 per cent nital

LARGE AUTOMOTIVE MERGER

Associated Motor Industries, With $80,000,000 Capital, Takes Over 14 Plants

A consolidation of manufacturers of automobiles, trucks and automobile parts, taking in 14 plants in seven states, with capitalization of $80,000,000, has been effected at Dayton, Ohio. The name of the consolidated company is the Associated Motor Industries. Main offices will be in Dayton. All of the plants are owned outright by the new corporation, the merger having been the result of actual purchase rather than transfer of property to a holding company.

Included in the new company are the following companies and plants: National Motor Car & Vehicle corporation, Lockport, N. Y.; Covert Gear Co., Lockport, N. Y., transmission and clutch manufacturer; Recording & Computing Machines Co., Dayton, Ohio, ignition, magneto, starter, battery and generator manufacturer; Jackson Motors Corporation, Jackson, Mich.; Kentucky Wagon Mfg. Co., Louisville, Ky.; Saginaw Sheet Metal Works, Saginaw, Mich.; Traffic Motor Truck Corporation, St. Louis, Mo.; Murray-Tregurtha Corporation, Boston, gasoline engines; H. F. Holbrook Co., New York, automobile bodies.

Officers of the corporation are: Will I. Ohmer, Dayton, Ohio, chairman of the board of directors; Louis Ruthenburg, Dayton, Ohio, president; A. A. Gloetzner, Lockport, N. Y.; Robert V. Board, Louisville, Ky.; T. C. Brandle, St. Louis, Mo., and George M. Dickson, Indianapolis, Ind., vice-presidents.

Directors include the above and the following: James R. Duffin, Louisville, Ky.; H. G. Stoddard, Worcester, Mass.; H. V. Hale, Saginaw, Mich.; H. J. Linkert, Dayton, Ohio; C. L. Halladay, Jackson, Mich.; W. W. Sterling, Jackson; C. L. V. Exselsen, Chicago; Guy Wilson, St. Louis; Buell Hollister, New York; H. F. Holbrook, New York; M. D. Flattery, Boston.

Mr. Ohmer, chairman of the board, made the following announcement regarding the new corporation:

This merger is unique in that it has purchased outright all its plants, instead of being a holding company. The usual thing in such mergers has been a holding corporation and separate operating corporations, the holding corporation owning a majority of the stock, with a full set of officers and each operating corporation having a full set of officers and staff. Associated Motor Industries eliminates all that duplication. The executive officers of the consolidation are the only executive officers of the merger. All the plants will be operated as a unit from the central offices. It is not an imitation of any organization that has gone before it.

As to prosperity, it is here now. We have only to accept it and go ahead with business. So much pessimism has been spread over the country that many people have lost belief in themselves. Associated Motor Industries believes that the time to start up is now. Business is ready right now for people who can make the right kind of goods at the right price.

It is the purpose of Associated Motor Industries to standardize and produce in such quantities as will get the cost of cars of quality within the reach of the people.

There is no question but that a reduction in cost so that prices will come within reach of the consumers' pocketbook must be brought about before there can be a return to "old-time prosperity." The manufacturer must be satisfied with smaller profits. And to be able to reduce the cost and work on smaller profits it is necessary to increase production by the most efficient methods.

As to my employment policies, they are well known and I shall have more to say about them later. I believe in paying people all they can earn, and making it possible for them to enjoy their work.

Women should receive the same pay as men for the same work.

I want employees to feel that they are partners in the business and share in the success of the business.

The interests of the employees of Associated Motor Industries shall have my personal care, and everything possible will be done to make them satisfied and happy.

Production in all of the plants will be started at full speed at once, Mr. Ohmer said.

PROMPT REPLIES

Independent Steel Companies Answer Questionnaire of Commission

WASHINGTON, July 4.—Replies in good-sized numbers are being received by the Federal Trade Commission from independent steel companies to the questionnaire it has sent out to all steel makers of the country in connection with its investigation regarding proposed mergers. The companies proposing to consolidate, including the Bethlehem Steel Co. and the Lackawanna Steel Co., and the Midvale Steel & Ordnance Co., the Republic Iron & Steel Co., and the Inland Steel Co., were the first to make response to the questionnaire. The freedom with which companies not involved in the proposed mergers have replied to the questionnaires apparently is a source of gratification to the commission. The replies, it was stated at the commission, are made complete wherever it is possible to do so.

Reports that the commission in asking for responses from companies not associated with the merger plans is actually attempting, without direction from Congress, to inquire into the entire industry of the country are strongly denied. It is insisted by the commission that, as stated in THE IRON AGE last week, the only purpose of sending out the questionnaire to all of the producers is to ascertain the effect of the contemplated consolidations on competition.

The questionnaire, aside from that portion of it inquiring as to the tonnage the producers sell in the United States and foreign countries, is largely formal and deals with matters that for the most part are already of public record through annual statements, trade papers, commercial publications, etc. The other information sought also is a matter of current knowledge, such as whether products of some companies are sold in the open market or to the parent company and, if both, the percentage of each.

The commission has not as yet taken any action regarding the issuance of a complaint against the Midvale, Republic and Inland companies and has not indicated whether it will or will not issue one. It also has done nothing as to the suggestion of the Bethlehem and Lackawanna companies to the effect that the hearing be set for an early date. It has been stated by the commission that no actual date for the hearing has been set. The fact remains, however, that it was announced in the notice appended to the Bethlehem-Lackawanna complaint that "on the 24th day of July, 1922, at 10:30 o'clock in the forenoon, is hereby fixed as the time, and the offices of the Federal Trade Commission * * * when and where a hearing will be had on the charges set forth in this complaint." It was stated at the offices of the commission that this was intended to mean only that the two companies had until July 24 to make answer to the complaint.

Clay Pipe as Substitute for Cast Iron

As a result of laboratory tests made in the College of Industries of Carnegie Institute of Technology, Pittsburgh, the claim is made by the institute that it has finally been established that bituminous clay pipe for drainage and sewerage use is in every way the equal of the more expensive cast iron pipe which has been employed heretofore. Details can be obtained by addressing R. S. Clark, office of the secretary, Carnegie Institute of Technology, Pittsburgh.

Charles Close, Bureau of Sanitation and Safety, United States Steel Corporation; Major William M. Hoag, National Tube Co., Charles Woolridge, Carnegie Land Co., and R. J. Young, Safety Department Illinois Steel Co., recently visited Gary, Ind., for the purpose of working out a plan for the construction of several hundred additional houses to take care of the employees of the tube plant to be erected there.

Trade Status of Some Minor Steel Products

Facts and Figures Collected by the Tariff Commission Relating to Production and Markets, Also the Export and Import Trade

INFORMATION concerning methods of manufacturing various iron and steel products, and their uses in manufacture and trade, together with data as to imports and exports, also the countries which compete with the United States in the manufacture of these products, is given in a volume of more than 1600 pages. The material in this book was prepared by the United States Tariff Commission for the use of the Senate Committee on Finance in making up the schedules in the pending tariff bill. All the articles in the various schedules are covered, the title of the book being "Summary of Tariff Information, 1921, Relative to the Bill HR 7456." From the sections devoted to the metal schedule the following paragraphs are taken relating to various manufactured forms of iron and steel:

Hoops and Bands Cut to Lengths—Cotton Ties, Etc.

This paragraph applies particularly to the standard cotton tie, a strip of steel 15/16 in. wide by 35/1000 in. thick (20 gage) and 11½ ft. long, chiefly used in tying bales of cotton. Once used, they are rerolled and used again. Production is part of the output of rolling mills making also hoops, wire nails, smooth wire, barbed wire, woven wire fence, bars, spikes, and similar products. Four plants are located in Pennsylvania, one in Georgia, and one in Alabama. The annual production is estimated at 2,000,000 to 3,000,000 bundles of 45 lb. each, approximately two-thirds of the world's output. England and Germany are the principal foreign producers. Imports of hoop or band iron, etc., in 1915 were 1,416,538 lb., valued at $22,552. In 1920 they were 131,370 lb., valued at $5,952, and in the first nine months of 1921 they were 1,055,366 lb., valued at $32,883. Exports are irregular; they depend almost entirely upon the cotton crop and English competition. It is roughly estimated that in recent years they have ranged somewhat over 1,500,000 lb. annually.

Galvanized Wire for Fencing and Wire for Baling Hay

Wire provided for in this paragraph is that used for fencing purposes and for baling hay and other commodities. The fencing wire is limited to galvanized, while the baling wire may or may not be galvanized. Barbed wire is provided for in paragraph 1680, and hence is not included in this paragraph. The country's output of woven wire fencing and poultry netting, plain and coated, in 1919, amounted to 312,150 tons, valued at $30,527,000. In 1914 the corresponding figures were 411,460 tons and $19,795,800. Exports of woven wire fencing since 1917 by calendar years have been as follows: 1918, $1,036,730; 1919, $933,143; 1920, $903,272; 1921 (9 months), $451,823. The principal destinations of this exported material were Cuba, Canada, Mexico, Argentina and New Zealand.

Woven Wire Cloth

Woven wire cloth consists of gauze fabrics, screens, etc., composed of wire with fine meshes and is used largely for straining and for protection against insects and the like. "Fourdrinier wires," or wire cloth used in paper making, are one of the most important items. In the figures of the Federal Census, the country's output of woven wire cloth is included with that of other woven wire products. Excluding woven wire fencing and poultry nettings, the output of woven wire products in the United States in 1919 amounted to 26,610 net tons, valued at $4,274,200. In 1914 the country's output was 22,720 tons, valued at $2,822,700.

Anti-Friction Balls and Bearings

Anti-friction bearings consist of metal balls or rollers fitted between two metal cases in such a way that a shaft may be inserted into the inner case, and the outer case into the bearing frame, the contact between the two cases being through balls or rollers. This arrangement substitutes a rolling contact for the sliding contact of the ordinary bearing and thus reduces friction. The automobile industry is the largest consumer of ball and roller bearings; the bicycle affords examples of the use of ball bearings. Some anti-friction bearings are used in screw jacks, many machine tools, elevators, etc. The domestic industry has gone extensively into both types of bearing—roller and ball. The European industry has given attention chiefly to the ball bearings.

Wheels for Railroad Purposes

The car wheels in general domestic use are either of chilled cast iron, cast steel, or rolled steel. A car wheel made with a cast or forged center piece, about which a steel tire is shrunk, is used to some extent. Locomotive drive wheels are of this type. It has been estimated that 3,000,000 chilled cast iron wheels, valued at $40,000,000, were produced in 1917. According to the 1920 census there were produced in 1919 117,700 gross tons of car and locomotive wheels, rolled or forged, valued at $17,044,700. Pennsylvania has a larger number of manufacturers than any other State; Michigan, New York and Ohio follow. European concerns have not developed the chilled cast iron or rolled steel wheels, which are the predominant types here. The bulk of foreign production has been the steel-tired wheel. Such wheels are likewise made here, and (according to report) before the war could be produced as cheaply as in Europe.

Chains

Structurally, chains made of iron or steel may be divided into (1) those with each link a single piece of metal, and (2) those with each link made of several pieces of metal. The first are used generally for fastening objects together or supporting or lifting weights. Such chains, if small, are chiefly made by machinery, but larger sizes are usually hand-made. Chains for cranes, ships' cables, dredges, etc., have each link welded by hand, often both formed and welded from the rolled bar iron. Those of the second class are known as sprocket or driving chains and are used for transmitting power. In certain of these each link is made of several pieces of metal connected by rivets, bolts, or steel screws, and so formed as to engage with the teeth of a sprocket wheel. The bicycle chain is a familiar example. Stud-like chains are those with a bar or rod across the width of the link. The United States is a large producer of chains made of iron or steel, but statistics are not available. A representative of an important producer estimated the investment in the chain industry in 1918 at $5,000,000 and the country's normal output at $10,000,000.

Bolts, Nuts and Washers

Iron and steel nuts, bolts, washers, spiral nut locks, etc., and their uses are for the most part well known. The word "blank" used in connection with nuts and bolts signifies a piece of metal that has been prepared for manufacture into these various forms. The term "washer" denotes a ring of metal or perforated plate used to distribute pressure to prevent motion or play. Spiral nut locks are special devices for locking a nut, as on a bolt, so that it may not be loosened by jarring. In 1914 the output of bolts, nuts, rivets and washers was valued at $23,403,000, in addition to that of builders' hardware which was valued at $24,280,000.

Horseshoe Nails

The tariff classification embraces horseshoe nails, the product of a distinct industry (the horseshoe nail

manufacturers generally make no other nail product), hobnails and shoe nails to a great extent made in tack mills. Production of horseshoe nails in 1914 was valued at $2,345,762. In 1918 there were six factories located in New York, Connecticut, Pennsylvania, and Illinois. The raw material used is nail rods or wire of soft steel or iron. One company has imported nail rods from Sweden, an important producer of horseshoe nails.

Wire Staples

The census heretofore did not specify wire staples separately. In 1914 the production of wire tacks, brads and staples, made in establishments drawing wire, was valued at $1,324,948. A portion of the product of wire staples is manufactured in the tack mills. In the 1920 Census wire staples figures were separated from those of wire tacks and brads and the 1919 output was shown as 68,221,300 lb., valued at $2,745,000.

Cut Tacks, Brads and Sprigs

Tacks and brads are of two kinds, cut and wire. Cut tacks and brads fall under this designation; those of wire (if of iron or steel) are included under "all other wrought iron and steel nails." "Sprig" is an obsolete word in the trade, formerly applied to sharp-pointed shoe-heel nails. Production of cut tacks and small nails in 1918 was estimated at from 50,000,000 to 60,000,000 lb., valued at approximately $6,600,000. The establishments making cut tacks also manufacture small nails cut from sheets, and to some extent wire tacks. Massachusetts leads in production of cut tacks.

Horse, Mule and Ox Shoes

The factory horse or mule shoe usually requires further working by the horseshoer to fit it to the hoof. Formerly he made the entire shoe from a bar; some shoes are still so produced. Production of horse and mule shoes by rolling mills, etc., was valued at about $9,000,000 in 1914. Hand production from bar iron (not recorded) was very small. In 1917 horse and mule shoes were produced by nine establishments, located in Pennsylvania, Ohio, New York, Illinois, and other States, as their principal or only product. Two large companies (one iron and one steel) are included in this number. Horse and mule shoes are formed by a series of rolling, bending and pressing operations, and, to a lesser extent and at a higher cost, by drop forging. The latter method is used chiefly in France, Belgium and Great Britian. Germany and Canada manufacture by a process similar to ours.

Steel Wool and Shavings

Steel wool consists of long steel fibers resembling curled hair. The fibers are of triangular cross section, and are graded according to fineness from coarse shavings to wool. Steel wool is used as an abrasive, and is a substitute for sandpaper and emery cloth or pumice stone, being regarded as superior to them for certain purposes. It is used in shipbuilding, in other building, in factories, and in the household. No accurate figures of production are available. In 1917 the yearly consumption was estimated at between 1,000,000 and 1,500,000 lb., which (imports being cut off) virtually represented domestic production. Germany and Switzerland are also producers.

Grit, Shot and Sand of Iron and Steel

Grit, shot and iron sand are chilled iron shot made by heating scrap or pig iron to a fluid state and spraying it with steam as it runs into a large vat of water. The grit is used in grinding rough surfaces of granite, marble and other stones. Production figures are not available. Before the war domestic consumption was estimated at 3200 tons. England is an important producer of these abrasives.

Wood Screws

Screws known in the trade as "wood screws," because intended for use in wood, are of mild steel or iron; or of brass, copper, and zinc when protection from rust is desirable. In 1914 wood screws, including those made of brass and bronze, were valued at $6,217,000, the output of twelve establishments. In 1919 the value was $16,462,000, the output of the same number of establishments.

Umbrella Ribs and Tubes

The United States is a large producer of umbrella and parasol ribs and tubes. The value of the annual production is estimated at from $1,250,000 to $2,000,000. Although figures regarding the extent of the output of parts are not available, the production of umbrellas, parasols and canes in 1914 was valued at $13,813,353, and in 1919 at $22,199,000.

Saddlery and Harness Hardware

The phrase "saddlery and harness hardware" is applied to buckles, rings, etc., made of metal and used on bridles, saddles and harness. In 1914 there were 58 establishments in the United States manufacturing saddlery hardware, with an output valued at $4,040,000. In 1919 the number of establishments had declined to 37, but the value of the product had increased to $14,137,000.

Snap Fasteners and Clasps

These articles are fastening devices chiefly for clothing, and are used as a substitute for buttons, hooks and eyes, buckles and pins. In 1914 snap fasteners and clasps, or parts of, amounted to 91,957 great gross, valued at $714,492. Production was estimated by a well-informed manufacturer in July, 1919, to be at the rate of about 1,500,000 great gross annually, valued at approximately $6,000,000.

Metal Buttons

The industry includes practically every kind of metal button, from the most ordinary button of sheet iron, made automatically, to the expensive gold button, made by hand. There are sew-on trouser buttons; tack buttons, put on by machine; bachelor buttons, put on by hand; uniform buttons, and buttons for women's and children's clothing. Connecticut, New Jersey, New York, Massachusetts, and Rhode Island are the leading States in the manufacture of metal buttons. Production in 1914 of steel trouser buttons amounted to 535,207 gross, valued at $307,802; other metal trouser buttons, to 252,248 gross; metal buttons, not including trouser or collar or cuff buttons, to 872,563 gross, at $455,485.

Pins

Production of common or toilet pins in 1914 amounted to 641,121 lb. plus 1,825,673 packs of 3360 pins of steel wire, and 1,186,397 lb. plus 1,638,035 packs of 3600 pins of brass wire, with a combined value of $1,248,757. Some firms report output in pounds and others in packs. Production of hairpins was 9,242,012 gross, valued at $528,362, and of safety pins, 4,744,303 gross, valued at $936,663. Production of common or toilet pins in 1919 amounted to 2,799,000 lb. plus 1,342,000 packs of 3360 pins of steel wire, valued at $1,521,000; and 741,000 lb. plus 1,089,000 packs of 3600 pins of brass wire, valued at $1,269,000. Production of hairpins was 24,310 gross, valued at $1,481,000; and of safety pins, 8,428,000 gross, valued at $2,977,000. The total value of common pins, hairpins and safety pins produced in 1914 was $2,713,782, and in 1919 was $7,248,000. Connecticut leads in the manufacture of articles covered by this paragraph. The leading foreign producers are France, Germany and England.

Pens

The domestic manufacture of steel pens began in 1860, when the knowledge of the quality of metal best adapted for their manufacture was acquired. Most of the steel used has been imported from England and Sweden. Five establishments, with a capital of $870,601 and 573 wage earners, manufactured steel pens in 1914. Materials used were worth $117,113, wages amounted to $243,043, and the value of the product was $513,498. Steel pens valued at $160,068 were also produced by establishments classified under other industries. The value of the product of five establishments in 1919 was $1,706,000. A pre-war estimate credited domestic production with 2,500,000 gross.

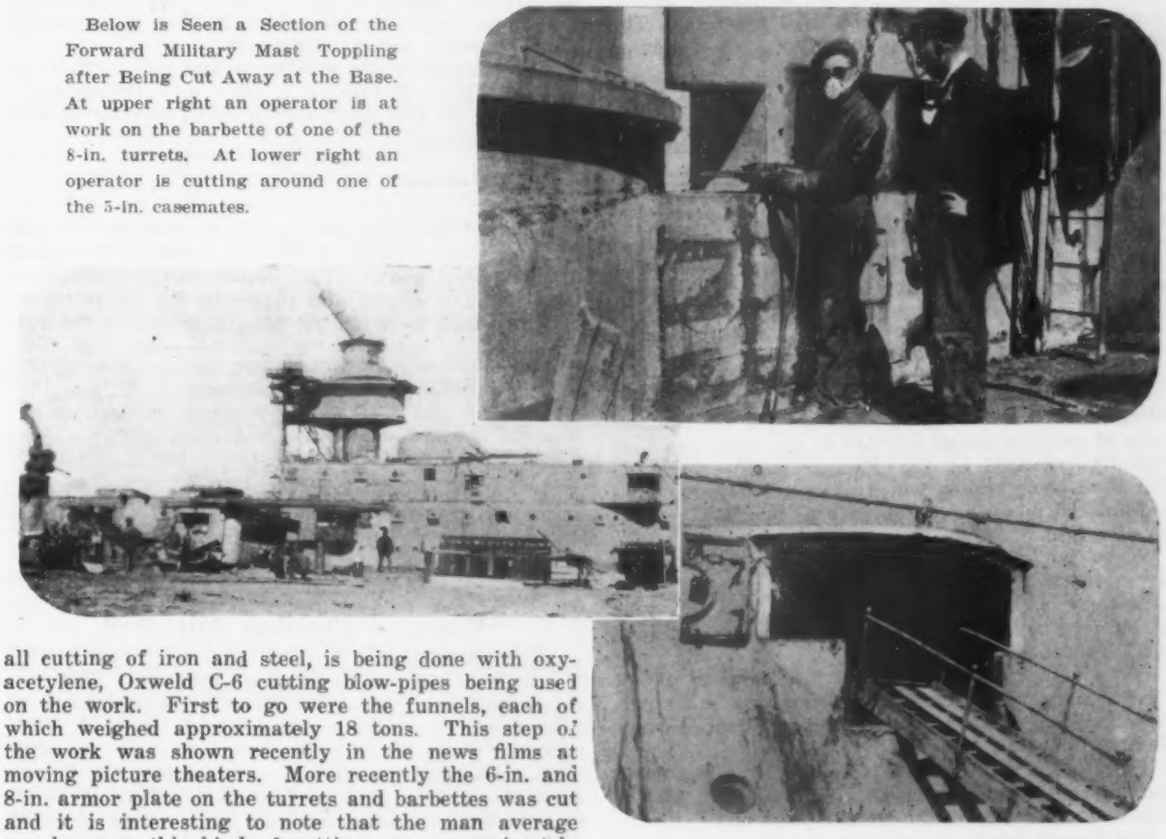
CUTTING CRUISER INTO SCRAP

Ten Feet Per Hour Speed of Advance on Armor Plate with Oxy-acetylene Blowpipe

With the cutting up into junk of the United States armored cruiser Brooklyn, famous as the fighting flagship of Admiral Schley at Santiago, there passes into the limbo of things departed a symbol of the new America. The Brooklyn, constructed at a cost of more than $4,370,000, was sold for $40,000 to a California dealer in scrap metals. It is estimated that the ship will yield 6500 tons of steel, and many tons of copper and brass, besides the miles of copper wire that were used in the electric signalling system. The four main engines, 18,000 hp. in all, will also afford valuable salvage in the form of parts that can be removed without injury and sold for other construction.

The major part of the demolition work, including all cutting of iron and steel, is being done with oxy-acetylene, Oxweld C-6 cutting blow-pipes being used on the work. First to go were the funnels, each of which weighed approximately 18 tons. This step of the work was shown recently in the news films at moving picture theaters. More recently the 6-in. and 8-in. armor plate on the turrets and barbettes was cut and it is interesting to note that the man average per hour on this kind of cutting was approximately 10 lineal feet. This cutting speed was attained with an oxygen pressure of 85 lbs.

In a general way the cutting that is being done on the Brooklyn is typical of the work that is being done not only in the newly created ship-breaking yards in this country, but in those of England and Japan, in the undertaking set on foot at Washington early this year. One picture of the work in progress on the Brooklyn shows a part of the foremast, atilt and about to fall after having been cut at the base of the section. This picture shows also a large supply of oxygen cylinders in the foreground.



Below is Seen a Section of the Forward Military Mast Toppling after Being Cut Away at the Base. At upper right an operator is at work on the barbette of one of the 8-in. turrets. At lower right an operator is cutting around one of the 5-in. casemates.

Federal Trade Commission Personnel

WASHINGTON, July 4.—Judge W. Vernon Van Fleet, of South Bend, Ind., was sworn in last Friday for a term of seven years as a member of the Federal Trade Commission and has assumed his duties. Judge Van Fleet until recently has been special assistant to the Attorney General, giving his attention particularly to re-organization work. He became associated with the Department of Justice in March, 1921. His appointment as a member of the Federal Trade Commission completes the personnel of that organization and is important to the iron and steel industry because of the activities of the commission as they relate to the industry. These include the Pittsburgh base and cost reporting cases as well as the investigation regarding proposed mergers of independent steel companies.

MECHANICAL PUDDLING

Ground Broken for First Unit of a Large Plant of Youngstown Steel Co.

Ground was broken last week by the Youngstown Steel Co., Youngstown, Ohio, for a mechanical puddling plant on a 415-acre site two miles north of Warren in Trumbull county. The initial unit in an extensive construction program, will consist of four machines, with a capacity of 250 tons of puddled iron per 24-hr., and rolling mill complement.

The rolling mill will consist of two stands of 3-high rolls, arranged tandem, and will be furnished by the United Engineering & Foundry Co., Pittsburgh. Rolling mill machinery to be installed at this time will handle up to 1000 tons of iron per day.

A rotary furnace will be installed for mixing the iron. From the time it enters the cupola furnace for melting until it emerges from the rolling mill, all operations will be mechanical. The plant will be fully electrified and will produce its own power. After the puddling operation, the iron will be removed in the form of a ball weighing from 2000 to 2500 lb., and will be pressed into ingot form by a hydraulic press. In this form it will be sent to the heating furnaces and rolled direct into billets, sheet bar or muck bar.

The present installation is merely the beginning of an extensive plant, plans for which have been drawn, to include a total of 16 mechanical puddle furnaces, two 500-ton blast furnaces and auxiliary by product coke ovens. Pig iron will be purchased on the market until blast furnaces are built later. It is planned to operate the initial installation for at least a year before undertaking extensions on any large scale.

The plant will produce a ton of puddled iron every 20 minutes. This compares with an average produc-

tion of 2500 to 2700 lb. by a puddler and helper, working five heats per day. Production costs by the mechanical process are therefore considerably less costly than by the hand-puddled methods now in effect in the majority of plants, and it is claimed the product is of a superior grade. It will be similar to the old-time hand puddled iron. Its corrosive resistance properties are said to be greater than those of steel. The structure of puddled iron is fibrous, instead of crystalline, as is the case with steel.

Present plans do not contemplate any finishing units and the company proposes to market its product in the semi-finished forms mentioned, making the product available for a diversity of uses in pipe, sheets, bar iron for railroad uses and the like. It is expected the first installation will be completed and ready for operation by the first of next year. Construction will be conducted under direction of the company's own organization.

Plans to proceed follow years of intensive experimentation by E. L. Ford, who is a director of the Youngstown Sheet & Tube Co. and a member of the executive committee of the Brier Hill Steel Co. The puddling machines are designed after plans patented by him.

One of the machines was built a number of years ago at the Brier Hill company's plant and has produced some tonnage in trial runs, which has proved satisfactory upon conversion into finished product. This equipment will be transferred to the Warren site and will form part of the new plant.

An office building will be erected at the plant to house the operating departments. At present, the company's principal office is located at 513 Stambaugh building, Youngstown. The company's name is to be changed to more properly conform to its product, while details of capitalization and reincorporation are still to be worked out. Contracts for buildings and electrical equipment for the plant will be awarded in a short time.

Associated with Mr. Ford in the enterprise are T. M. Phillips, general manager of the company, and H. Z. Bixler, chief engineer. Mr. Phillips has been identified with the iron and steel industry in the Mahoning Valley for many years, and previously had charge of blast furnaces and the washed metal plant of the Brier Hill company.

Mr. Bixler was formerly chief engineer of the Brier Hill company, but has been with the Youngstown Steel Co. for the past two years. J. P. Suter, formerly accountant with the Republic Rubber Corporation, Youngstown, is secretary-treasurer.

The company's site at Warren has rail connections with the Erie, Baltimore & Ohio and Pennsylvania railroads. At the start, only a small number of men will be employed.

FRENCH TARIFF CHANGES URGED

Commission Suggests Increased Duties on Hematite Iron, Spiegeleisen, Tool Steel, Hoops and Sheets

(*By Correspondence*)

PARIS, FRANCE, June 15.—The recently published findings of the Departmental Commission for the Revision of customs duties relative to pig iron, has been generally criticized by the French engineering and other steel-using trades, which want to obtain raw and semi-finished materials as cheaply as possible, regardless of origin.

While the pig iron capacity of France since the war is 10 to 12 million tons annually, last year only about three million tons was produced, and this year the increase will probably be only about one million tons. Therefore production in 1921 was only one-fourth and in 1922 probably will be one-third of the total capacity. Producing at full capacity under normal conditions France probably could not consume more than one-half her output.

Therefore, France, which before the war had never been an iron exporting country, is being led by the force of altered circumstances to become one.

But French producers are now meeting with strong competition in foreign markets from Germany—favored by the fall of the mark and by intensive production—as well as from Great Britain, Belgium and Luxemburg, the two last named countries being now economically united, and the French producers are forced to offer foreign purchasers prices often below cost. The inland market is relied upon to make up these losses. But there again producers are confronted by keen Belgian and British competition. Both Belgium and Great Britain, which are receiving the minimum rates of the French tariff, have lately succeeded in exporting to France quite important quantities of hematite pig iron, sheets and plates, and rolled merchant products.

French blast furnaces are now paying for coke (mostly German) 93 fr. ($7.75) per ton at the Franco-German frontier. (There is a refund of 20 fr. per ton ($1.68) on coke used in making export pig iron), while British blast furnaces, for instance, pay about 28s. per ton ($6.16). On the other hand, wages and other charges are higher in France than in Great Britain and in Belgium.

French iron-makers, because of this situation, have asked for an increased tariff protection. The French consuming industries have protested, claiming that if they obtain their raw materials at a low price they can increase their exports of finished products, machinery and electrical goods. The Departmental Commission took a middle course and suggested the following revisions, which have not yet been approved by the government:

Product	New Duty (Fr. per Metric Ton)	Old Duty (Fr. per Metric Ton)
Hematite iron and spiegeleisen	37.50	30.00
Pig iron, other kinds	27.00	30.00
Steel ingots	99.00	76.50
Tool steel, per 100 kg.	52.50	39.00
Other special steels, per 100 kg.	125.00	95.00
Hoops and strip steel, hot rolled, per 100 kg.	13.00	15.60
Hoops and strip steel, cold rolled, per 100 kg.	24.00 to 39.00	11.20 to 18.20
Iron and steel sheets, cut, per 100 kg.	11.25 to 18.00	10.50 to 16.80

Wages of Puddlers Advanced

YOUNGSTOWN, July 3.—Boiling rate for July-August will be $8.53 per ton, based on a 1.60c. card. This was determined June 28 at the bimonthly examination of sales sheets conducted at the office of James H. Nutt, secretary of the Western Bar Iron Association, Youngstown. Examination of reports of shipments of base sizes of bar iron shipped from April 20 to June 20 by mid-Western mills disclosed an average price of $1.604. This compares with an average of $1.50 per 100 lb. at the settlement two months previously, and represents an advance of two points on the card rate. Puddlers were paid $7.63 per ton in May and June.

The wage rate for boiling will be $8.53 per ton for the reason that the boiling base rate was advanced 50c. per ton, in the new agreement with employees, effective from July 1. Under the agreement which expired June 30, the puddling rate on a 1.60c. card was $8.03. In the new contract, the base puddling rate is increased from $5.50 to $6 on a 1c. card, with a 50c. advance applying at all card points above 1c.

Shipments for the period covered by the settlement showed an appreciable gain as compared with the 60 days ending April 20.

Finishers receive an increase of 4 per cent as a result of the settlement, and will be 28½ per cent above the rates in the scale for July and August.

Employees were represented by officials of the Amalgamated Association of Iron, Steel and Tin Workers, located at Pittsburgh.

Manufactured gas sold in 1920, nearly 500 billion cu. ft., was greater than ever before. The value is estimated by the United States Geological Survey at over $300,000,000.

METAL SCHEDULE COMPLETED

Further Announcements May Be Made, However, Before Tariff Bill is Passed

WASHINGTON, July 4.—The metal schedule of the tariff finally has been completed by the Senate sitting as a Committee of the Whole, but when the bill is presented to the Senate as a body and the parliamentary status permits it, it is expected there will be many amendments offered other than those made by the Senate Committee on Finance itself. While it is not likely that the attacks that will be made on the schedule by Democrats as well as some so-called progressive Republicans will yield any changes of importance, the schedule undoubtedly will be subjected to further sharp criticism, such as was made on it during the past few weeks.

The iron, steel and foundry interests are greatly displeased at the action of the Senate with regard to the duties it has placed on raw materials. At the same time, those who have been urging protection for these materials are gratified at the duties named.

Estimated Increase in Costs

Estimates have been made here that iron and steel costs because of the proposed tariff duties fixed by the Senate on raw materials will be increased by $21,757,962 annually. This compares with $23,805,225, which Chairman John A. Topping of the Republic Iron & Steel Co. estimated they would cost annually in the production of steel. Mr. Topping made his statement as a representative of the independent iron and steel industry before the Senate Committee on Finance in the course of hearings on the metal schedule. His estimate was based upon House duties on ferrosilicon, fluorspar, manganese ore, magnesite, pig tin, and zinc. He appeared in opposition to duties on these products and asked that ferromanganese, if made dutiable, be given no higher rate than pig iron.

Action of the Senate committee in reporting the bill had partly followed suggestions made, particularly in the case of manganese ore, which was made free, ferromanganese, which was given a duty of $2.50 per ton and pig tin which also was made free. But as amended upon the initiative of the committee itself, the Senate as a Committee of the Whole, restored the House duty of 1c. per lb. (of contained manganese) on manganese ore and fixed a duty of 1⅞c. per lb. (of contained manganese) on ferromanganese containing more than 1 per cent of carbon as compared with the House duty of 2 1/5c. per lb. Rates on ferrosilicon were revised downward in the Senate and pig tin was left on the free list, but the duty on fluorspar was increased by the Committee on Finance from the House duty of $5 per ton to $5.60 per ton and the duty of $10 per ton on crude magnesite carried in the House bill was restored by the Senate after somewhat lower rates had been reported by the Committee on Finance.

Mr. Topping's Figures Revised

Iron and steel producers who are opposed to the duties fixed on raw materials, using the duties adopted by the Senate, have revised the figures presented by Mr. Topping which were based on House duties and have made estimates as to increased costs as follows:

	Annual Requirements Tons	Proposed Tax Per Ton	Tax per Annum
Ferrosilicon, 57 per cent	80,000	$25.50	$2,043,200
Fluorspar	300,000	5.60	1,680,000
Manganese ore, 48 per cent	750,000	10.75	8,062,500
Magnesite	150,000	10.00	1,500,000
Zinc (first two years)	†426,986,416	*0.0175	7,472,262
Total			$21,757,962

*Per pound. †Pounds.

The duty determined upon for ferromanganese recalls the statement of Mr. Topping before the Committee on Finance that independent steel interests might form a co-operative company of two or three concerns and put one or two blast furnaces on ferromanganese for joint use:

"And that is what we would have to do if this (House) rate goes through without change, because we could not afford to be at the disadvantage that this bill contemplates placing on us as compared with the cost of manganese per ton of steel made by the Steel Corporation. Should we import our ore and pay the duty you proposed in this bill, and manufacture our own ferro, it will be more economical than to buy our ferromanganese in the open market."

Changes Adopted

The final and important changes made in the metal schedule included the following:

Chain (paragraph 329) not less than ¾ in. in diameter, duty reduced from 1c. to ⅞c. per lb.; less than ¾ and not less than ⅜ in., duty reduced from 1¼ to 1⅛c. per lb., etc.; sprocket and machine chains, duty reduced from 50 per cent to 35 per cent ad valorem; for shovels, spades, etc. (paragraph 373), duty of 35 per cent reported by the committee agreed to.

New paragraph (392B) submitted by Chairman McCumber fixes duty of 60 per cent on twist drills, reamers, milling cutters, taps, dies, and metal cutting tools of all descriptions, not provided for, containing more than 0.6 per cent of tungsten or molybdenum, this action following complaint of tool steel makers that they had been given a duty of only 40 per cent while their raw products had been made dutiable at 60 per cent.

PACIFIC COAST COMPANY

California and Utah Capitalists Plan a $15,000,000 Enterprise

SAN FRANCISCO, June 30.—Announcement is made to-day by Wigginton E. Creed, president of Columbia Steel Co., of the projected organization of a $15,000,000 independent steel and coke company on the Pacific Coast, following the acquisition of extensive coal and iron properties in Utah from the Utah Coal & Coke Co. by the Columbia Steel Co. The new company, which will be organized for the manufacture of steel products and coke as soon as practicable, is being backed by several prominent capitalists of Utah and California. Among the San Franciscans interested are: W. E. Creed, H. D. Grant, A. E. Boynton, Joseph Sloss, W. P. Hammon, John S. Drum, Herbert Fleischhacker of the Pacific Coast Steel Co., Mortimer Fleischhacker and Alfred Esberg. The Utah group includes: W. W. Armstrong, president National Copper Bank of Salt Lake City; L. R. Rains, president Carbon Fuel Co.; Adrian C. Ellis, Jr., A. M. Clark and D. H. Botchford.

The properties being acquired comprise 3120 acres of coal lands and the townsite of 1160 acres near Sunnyvale, Carbon County, Utah, and a number of patented claims covering the iron deposits in Iron County.

For the past eight months those interested have been investigating the possibilities of developing the resources acquired. Although it has been decided to construct a plant for the manufacture of fabricated material, complete plans have not as yet been reached. W. E. Creed makes the following statement: "The Columbia Steel Co. has acquired the coal and iron properties of the Utah Coal & Coke Co., situated in Carbon and Iron counties, Utah. The purchase will be effected through the organization of a new corporation to take over the rolling mills and steel foundries of the Columbia Steel Co. and the assets of the Utah Coal & Coke Co. An intensive investigation, extending over a period

of more than eight months, has demonstrated that the Utah coal and iron properties can be used to form the basis of an independent steel industry for the Coast and Mountain territory. Definite plans have not been matured, except to the point of effecting the purchase and consolidation, but the program for future developments is now being worked out. The West needs the basic industries of iron and steel fully developed, and an unusual opportunity exists for progress in this direction by co-operation by California and Utah."

The building of a blast furnace to supply pig iron to the Columbia and Pacific Coast steel companies is part of the plan of the new company and has been long contemplated.

GERMAN PRICE TREND UPWARD

Export Demand for Machinery and Electric Material—French and Belgian Competition on Pig Iron and Steel

(*Special Correspondence*)

BERLIN, GERMANY, June 14.—The domestic iron and steel market continues active. This is also true of the export market for finished metal goods, machinery and electro-technical articles, but in heavy and semi-finished products there is increased French and Belgian competition, and in pig-iron, for which the domestic demand is great, there is more dependence upon imports from France. The failure of the reparations loan has not affected business in the way predicted. The expectation was that if the loan failed the mark would collapse, and an increased domestic and export boom would result. The mark has, however, so far fallen only a little; and business conditions have on the whole remained unchanged.

Domestic prices are still rising, although at a reduced rate. The *Frankfurter Zeitung's* wholesale commodities index, which is based on 100 for January, 1920, showed for the beginning of June 606, against 584 on May 1. Assertions that Germany cannot compete appear daily in the trade press, but are in general untrue. The *Frankfurter Zeitung* index for twenty-one standard finished products shows a forty-six-fold increase. As the dollar is appreciated about seventy fold, German prices for finished articles are materially lower than in 1914, if expressed in dollars or in gold. The official "Wirtschaft und Statistik" correctly shows that in March, American prices were 154 per cent above German.

Production is increasingly threatened by fuel shortage. The Ruhr coal output in May was 25,000 tons a day less than in March. The Ruhr miners have rejected a Government proposal to do extra work on four days a week, at increased pay. Lack of coal is the main cause of the pig iron shortage. The importing body, the Pig Iron Syndicate (Roheisenverband) is now offering its customers large quantities of Luxemburg foundry iron No. III, at a price of 195 French francs ($16.34) per metric ton, duty paid, delivered on the Lorraine or Luxemburg frontier. At present exchange, this makes less than 5500 m. per ton ($14.85), or below the latest German price of 6133 m. ($16.57) but these imports were contracted for when the mark stood materially higher than now.

Rising Prices for Metal Products

As cabled June 3 (June 8 issue of THE IRON AGE), the "Eisenwirtschaftsbund" again raised pig iron prices, effective June 1. Simultaneously, ferromanganese 80 per cent was raised from 14,415 m. ($38.92) to 15,415 m. ($41.62); 50 per cent from 13,735 m. ($37.08) to 14,400 m. ($38.88) and ferro-silicon 10 per cent from 7750 m. ($20.92) to 8100 m. ($21.87). The reason given was the increase in cost of coal, transport and wages. The Steel Syndicate (Stahlbund) decided on June 8, to make no change in semi-finished products, bars, shapes, wires, plates and rails. [An advance of 12 per cent was made on June 22, as given in THE IRON AGE of June 29, p. 1845.—EDITOR.] The prices of finished metal goods are still rising, though slowly. The Central Association of Electro-Technical Industries lately raised machines and transformers 10 per cent and small articles 20 per cent. The Trade-Screw Association yesterday raised its prices, which had been unchanged since April, by varying amounts, the highest being 6500 per cent above peace rates.

A movement led by Hugo Stinnes, aims to encourage importation of French semi-finished products on a large scale, in order to take care of Germany's finishing industries. The Lorraine mining industry shows nervousness at the decline in German ore buying, fearing that the increased German importation of pig iron is only temporary. The *Journée Industrielle* declares that good relations must be established between French smelters and German pig iron consumers, as the only way to prevent the Thyssen, Kloeckner and other groups re-establishing in Westphalia the great Hagendingen, Kneutingen and other smelting works which passed to France under the peace treaty.

Some Lines Not Prosperous

The market for plates is less satisfactory, sales of heavy plates being damaged by the inactivity in shipbuilding, caused mainly by lack of money. The paper-mark compensation for the shipping companies' war losses agreed on with the Goverment in March, 1921, has largely lost its value through price increases. In thin plates England and Belgium are both underselling Germany, by as much as 2000 m. ($5.40) per ton. The Upper Silesian smelting and rolling mill companies have orders for several months. The small iron and steel finishing branches report reserve by buyers, and complain of shortage of materials. Reports from manufacturers of tools, screws, saws and hammers, and locks and fittings complain of stagnation. A great demand for plates, wire and tubes is noted in Upper Silesia, but the local fuel supply is insufficient. Many Silesian coal miners, fearing worse living conditions under Polish rule, have left the mines.

Labor More Efficient

Favorable data are appearing as to the recovery in labor efficiency. The Prussian factory inspectors report that in some rolling mills, per capita production has risen to 95 per cent of that of 1913; and that one blast furnace which produced 5895 tons of iron a month in 1920 produced (for the same number of employees) 7765 tons in 1921. The Ukrainian Government has been negotiating with German smelting interests to work the manganese mines of the Ukraine; but negotiations were suspended because of the German condition that only high grade ore should be mined. An English counter offer is under consideration. The Austrian Government has leased the Wollersdorfer mechanical works to the General Electricity Co. On these works Austria has been losing at the rate of fifteen billion crowns a year. The term of the concession is fifty years. A company capitalized at one billion Austrian crowns will be formed, Austria receiving one-third of the shares for land, buildings, plant and raw materials in stock, but not ready machines.

GERMAN IRON AGAIN ADVANCES

Higher Coal Prices Force Pig Iron Upward 15 Per Cent On Top of June 1 Advance

BERLIN, GERMANY, June 30.—Another advance in pig iron has been determined on by the Eisenwirthschaftsbund, effective July 1. It amounts roughly to 15 per cent. Prices had been raised 5 to 6 per cent on June 1. Meanwhile the value of the mark is sharply receding and for the moment the dollar equivalent of various grades of iron is as follows: Hematite pig iron, $19.50, foundry No. 1, $18, spiegeleisen, $20.50. Higher coal prices are expected and these will increase automatically the price of iron.

The New Castle, Pa., plant of the Carnegie Steel Co. is now on a 100 per cent basis, with resumption of Rosena or No. 1 blast furnace in the New Castle group. The stack was lighted June 27 with appropriate ceremonies.

American Society for Testing Materials

Annual Convention Discusses Steel Castings and Pig and Cast Iron—Sulphur in Steel—Symposiums on Impact Testing and Fatigue of Metals

FOR many years prior to 1920, the American Society for Testing Materials had held its annual meetings at Atlantic City, N. J., but in 1920 and 1921, Asbury Park, N. J., was the meeting place. The society this year featured its twenty-fifth annual meeting by returning to Atlantic City and previous records for attendance were broken. At the last meeting at Atlantic City in 1919, the record attendance of 692 men and 174 women was made; this year the attendance was estimated at not less than 725 men and 175 women. The meetings were held from June 26 to 30, inclusive, in the spacious auditorium and rooms of the new Haddon Hall Hotel and the technical sessions were distinctly large and enthusiastic. While there were no features of unusual significance, the papers and the reports of the various committees were of the usual high order. Several new tentative specifications, including carbon steel castings for railroads and high-test gray iron castings, were adopted. There was an important symposium on impact testing which made history in this particular subject. An important section of one session was devoted to the fatigue of metals.

Two sessions were devoted entirely to iron and steel matters. The one on steel, which covered also steel castings, was restored to its old place on the program, being held on Wednesday morning. In the program devoted to wrought, cast and malleable iron, specifications for pig iron and cast iron were uppermost topics.

Session on Steel

Three principal topics were discussed at the session devoted to steel, at which Vice-President Guilliaem Aersten presided. The subject to which most of the attention was devoted was the tensile properties of steel castings. Other topics were the effect of sulphur on rivet steel and various methods of testing the welds in butt-welded steel plates.

Because of the fact that part of the report of committee A-1 on steel was the presentation of new specifications for carbon steel castings for railroads, the committee's report was presented in conjunction with a paper entitled "Tensile Properties of Steel Castings" by Lawford H. Fry, Standard Steel Works Co., Burnham, Pa.

New Specifications

New specifications for steel castings for railroads were the result of the work of the joint committee of the American Railroad Association and the American Society for Testing Materials, the final draft having been agreed upon March 24, 1922. The report of the society's representatives on the joint committee was signed by J. C. Davis, fourth vice-president American Steel Foundries, Chicago. It was emphasized that the sub-committee spent a great deal of time on the questions of elastic limit and yield point. It was finally agreed upon by the majority that the yield point by drop of beam or by dividers gave the most uniform results for steel castings and it was decided the yield point should be determined in either of these ways. The specifications also provide that the manganese requirement be placed at a maximum of 0.85 per cent, this concession being made to satisfy the majority of consumers. These specifications will be published later in THE IRON AGE.

Before the adoption of these specifications as tentative, Mr. Fry's paper was presented in abstract by the author. It deals with the tensile properties of steel castings made of grades commonly used for railroad service and is a comprehensive study of the subject. It covered an investigation which involved the examination of about 600 tests from seven manufacturers. In one series of tests, the tensile properties as usually determined are compared to show the relation between strength and ductility, and the relation between yield point and the elastic limit, determined by the method for forgings adopted by committee A-1 on Steel. In a second series, the so-called true elastic limit is compared with the yield point by a series of tests involving much greater precision than usually applied in commercial testing. Complete data of all the tests are given together with charts. The tests were made by a group of manufacturers of steel castings as a contribution to the work of the joint committee on the new specifications for steel castings. The author of the paper was the chairman of the committee and the other members were H. M. Lewis, Pratt & Letchworth Co.; C. N. Ring, Ohio Steel Castings Co.; J. D. R. Stehman, Birdsboro Steel Foundry & Machine Co.; and J. L. Uhler, Union Steel Casting Co. The author stated that the results of the tests show that, with even a moderate degree of precision in the method of measurement, annealed cast steel is found to behave as a plastic rather than an elastic material and that the term "elastic limit" has little meaning.

In the discussion which followed George F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., called attention to the fact that no extensometer had been used in the tests and criticized the use of the Berry strain gage, implying at the same time that the results were not, therefore, scientific. Mr. Fry replied that the use of a more accurate extensometer would not have changed the general results. Prof. H. F. Moore, University of Illinois, Urbana, Ill., reviewed some of the points brought out by the author and stated that, as a result of much of the work done at his laboratories, there was no evidence yet of the existence of any absolute point for the elastic limit.

The new specifications were formally adopted as tentative together with the committees' report as a whole.

Changes in Steel Specifications

The report of the committee A-1 contained also recommendations involving minor changes in standard and tentative standard specifications. These embraced eight proposed revisions in standards and two proposed revisions in tentative standards. During the year, one new sub-committee was appointed as sub-committee XIX on sheet steels. The report announced that 11 specifications have been approved during the year for submission to the secretary-treasurer for transmission to the American Engineering Standards Committee.

Sulphur in Rivet Steel

Some disappointment was evident that there was but little discussion of the preliminary report of the joint committee on the investigation of phosphorus and sulphur in steel, covering in particular the effect of sulphur on rivet steel, presented by the chairman, Dr. George K. Burgess. Supplementing his presentation of the abstract of the report (given in THE IRON AGE of June 22) Dr. Burgess said that the committee's work on rivet steel was practically completed with the exception of a few minor points; that for the investigation on sheets, the steel had been manufactured and tests were being prepared; that the work on grade-B steel had progressed rapidly and tests were nearly completed and that for the investigation on forgings, the steel had been promised. So far as conclusions were concerned covering the report on rivet steel, the committee had felt that, until all the data had been completed and studied, the publication of any conclusions or comments was unwise.

Henry S. Rawdon, Bureau of Standards, Washing-

ton, read an interesting discussion commenting on one of the features of the report involving the effect of heat treatment and notched bar impact test on a low carbon steel containing 0.056 per cent sulphur. He showed that in both the Charpy and Izod tests the fractures varied decidedly as to whether the breaks were through the crystals or not, depending on the heat treatment.

Dr. John S. Unger, director Central Research Bureau, Carnegie Steel Co., Pittsburgh, read a written discussion, the substance of which follows:

For more than 40 years the question of the effect of sulphur in steel has attracted the attention of metallurgists. Much study has been given to this subject, extending so far as to include the several chemical forms or combinations in which it exists, particularly in cast iron.

Within a period of 20 years, the tonnage of steel made by the two principal processes, the Bessemer and the basic open-hearth, has undergone a great change. In 1900 about 65 per cent of the total was Bessemer; in 1920 it was 25 per cent.

With the change in processes came a change in the sulphur content in steel, the average sulphur in Bessemer steel being at least 0.065 against 0.040 per cent in the basic open-hearth. Structures of all kinds built from 20 to 40 years ago of Bessemer steel, are still in service today. Additional evidence is found by making a study of soft, medium and hard steel parts which have worn out in service, giving a good life, and which in many cases have contained more than 0.065 per cent, sulphur. On the other hand, equally convincing evidence is found for the same kinds of steels failing after a short time in similar service, in which the sulphur has been under 0.040 per cent. Evidence of this kind is enough to make one hesitate in forming an opinion whether a reasonable amount of sulphur, say under 0.100 per cent, is detrimental or otherwise. These facts conflict with the generally accepted opinion that steel is of poor quality and should not be used for any important work, unless it be low in sulphur. I sincerely hope the committee will give this angle of their work serious consideration in their future studies.

In discussing the committee's preliminary report, I have copied graphs from their report, combining a number of their graphs on a single sheet and inserting a line for sulphur in order that it may be more easily and quickly comprehended. In this chart, I have shown the composition curves for carbon and manganese at the bottom, adding a line for the sulphur content. Since the ordinates and abscissas are in percentages of sulphur, the line for sulphur becomes a gradually rising straight line.

The effect of the carbon and manganese in the several heats is clearly shown by the approximate parallelism of the composition curves with those representing the tensile, shearing, torsion, impact and hardness curves. All the curves for the physical properties are not shown as there is not sufficient space.

The striking thing seems to be that changes in the carbon and manganese content are immediately reflected by similar changes in the physical properties of the several heats with little, if any, change due to the increasing sulphur. It is almost impossible to make a number of heats of steel containing exactly the same percentage of carbon and manganese. Since this is true, it is practically impossible to determine the effect of sulphur if other variables in composition exist in the steel.

In studying this same problem during 1915, I believed it best to use the same heat of steel, but to vary the sulphur content in the individual ingots of the heat. My results were given in full in a paper before the Society of Automotive Engineers, January, 1916, and later in a paper before the American Boiler Manufacturers in June, 1916. [THE IRON AGE, Jan. 13, 1916.]

Many persons are inclined to believe that sulphur added to steel does not have the same effect as residual sulphur remaining in the steel, but it is surprising how closely my results, obtained by added sulphur, check the results of the committee's work with residual sulphur, when allowances are made for the effects of the variations in the carbon and manganese in the several heats.

The committee's work was confined to rivet steel, but this same quality steel is used in making wire products, tubular products and sheets. The specifications for such products specify the composition and sometimes calls for tensile tests and bending tests. The fitness of the steel is determined by the working of steel during fabrication and by such shop tests as flattening, bending, hydrostatic or beading tests. On pp. 9, 10, 11 and 23 of the report, some shop tests are given, showing very little differences among the steels. These are some of the commercial tests employed by the user to show whether the steel is of good quality, yet the committee, beyond stating what was done, have not made any comment on the quality. Instead physical or mechanical tests of many kinds were made, very few of which are ever regularly used in the arts.

I have examined the complaints or claims for rivet steels covering a period from 1911 to 1922, or 11 years. They show the following percentages:

	Per Cent
For Quality:	
Mixed steel and tensile strength	15
For Surface:	
Mechanical defects, seams, pipe, split heads	28
For Rolling:	
Out of round } Variation of size }	6
For high sulphur	51
Total	100

This table shows that more than one-half of the complaints were due to high sulphur, in most cases causing the rejection of the steel without any effort being made on the part of the user by shop or service tests to see if the steel was really bad or unfit for use.

The committee has refrained from drawing conclusions from its work. The graphs are not easily understood by the layman. Considerable time has elapsed since the work was begun. Probably a much longer time will be needed for the study of the medium and harder varieties of steel. In the meantime, much commercially good steel is being thrown away. The producer and consumer are awaiting the verdict.

I ask the committee to hasten its work, drawing conclusions as it proceeds and completing the work at an early date. This will be of great benefit to our society, settling, partially at least, a controversy of many years' standing.

Dr. Unger exhibited a series of lantern slides taken from a paper contributed by him before the Society of Automotive Engineers in January, 1916, which involved an investigation of sulphur in various forms of rolled products, and the effect of the sulphur on these products when worked. The original paper was published in THE IRON AGE, Jan. 13, 1916.

Heat Treatment of Iron and Steel

The report of committee A-4 on the heat treatment of iron and steel, in the absence of the chairman, H. M. Boylston, was presented by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The report states that one sub-committee was making an investigation to determine the desirability of annealing wrought iron chain at intervals, and that another sub-committee, on the heat treatment of steel castings, has recommended a substitute for the present recommended practice for the annealing of carbon steel castings. The latter was accepted by the Society as tentative and the report as a whole was adopted.

Magnetic Testing of Welds

A highly interesting paper entitled "Electrical and Magnetic Weld Testing as Applied to Butt-Welded Steel Plates" by T. Spooner and I. F. Kinnard, research engineers Westinghouse Electric & Mfg. Co., East Pittsburgh, was presented in abstract by Mr. Spooner. The work described by this paper involves a series of laboratory tests applied to arc-butt welded steel plates to ascertain whether it is possible to develop electrical and magnetic tests capable of revealing the quality of such welds. The paper describes the various apparatus and the methods of applying the electrical and magnetic tests and then these are compared with tension tests from the plates which had been tested electrically and magnetically. It states that the electrical, magnetic and tension tests showed a very fair general agreement among themselves, as well as with the known quality of the welds as reported by the welder. As a result of the tests, the authors feel that the electrical and magnetic methods of testing show considerable promise, at least as applied to butt-welded plates, and that without doubt a really poor weld can be demonstrated. They also feel that the methods described can be applied commercially by suitable alterations in the details of the apparatus so as to provide a more rugged portable device. They hold that such an outcome will greatly increase the possible applications of electrical and gas welding, since it should be feasible to eliminate poor welded sections before any harm could come to a completed structure.

In discussing this report, Dr. Burgess commented on the excellence of the data brought forth and

asked whether the authors believed that the magnetic tests could be adapted to the testing of electrically welded rail joints in position, to which Mr. Spooner replied that, while no work had been done on this subject, they were justified in saying that it could be applied to such rails.

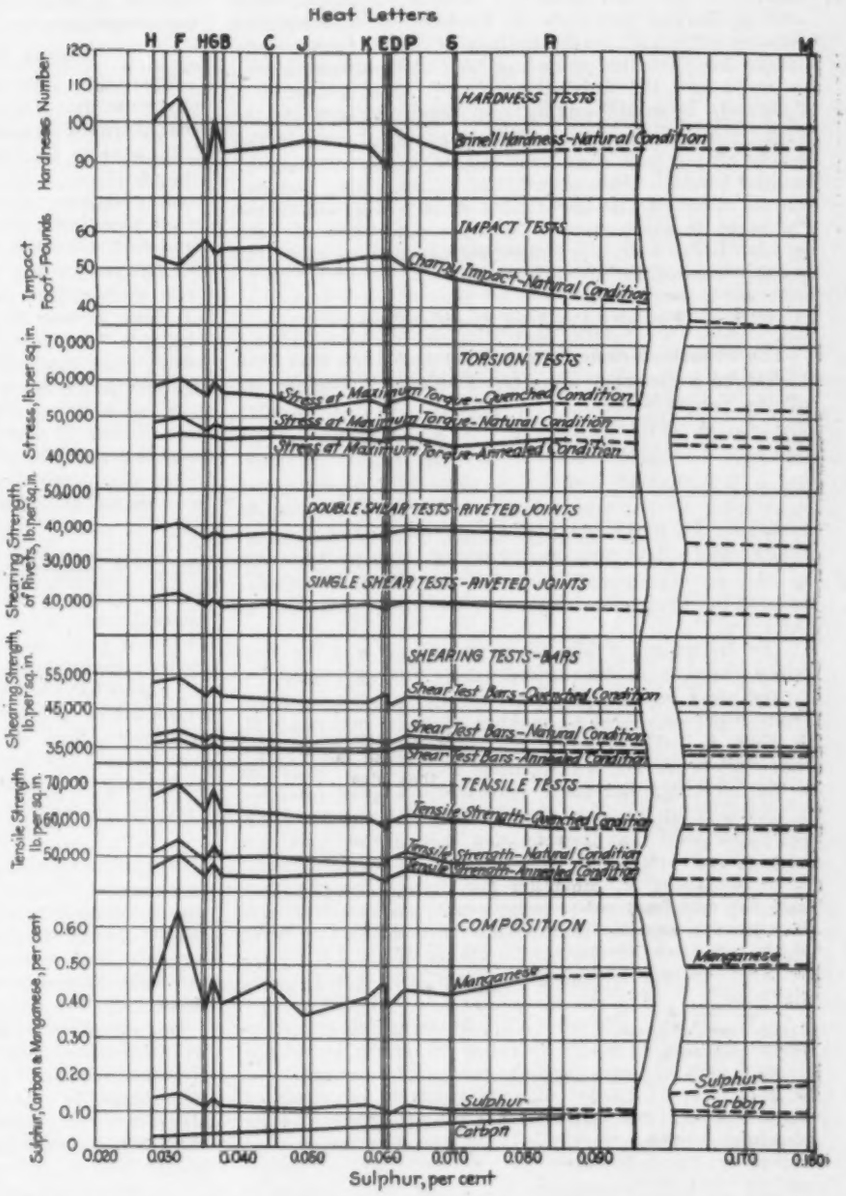
Session on Iron

The session on wrought, cast and malleable iron was held Tuesday afternoon, June 27, with Vice-president Burgess in the chair.

Some problems connected with foundry pig iron were easily the leading topics of this meeting. The subject was introduced by paper entitled "The Physics of Cast Iron and Its Bearing On All Cast Iron Products and Specifications for Cast Iron" by William R. Webster, consulting engineer, Philadelphia, followed by a report of committee A-3 on cast iron, the two subjects being thrown open to general discussion after their presentation.

Physics of Cast Iron

Mr. Webster's paper was presented in abstract by Dr. Moldenke. After referring to some of the earlier discussions of the physics of cast iron before the American Institute of Mining Engineers at one of its meetings in March, 1895, in which the author presented a brief note on a proposed scheme of the study of the physics of cast iron (which led ultimately to the preparation of the testing society's standard specifications for foundry pig iron) Mr. Webster draws attention to the importance of reducing to the lowest possible minimum the great variety of chemical compositions of pig iron now used in the manufacture of steel, gray iron and malleable iron castings.



Various Charts of the Investigation on Sulphur in Rivet Steel Compared with a Chart of the Carbon and Manganese Composition. This was prepared and used by Mr. Unger in his discussion

At present, the chemical requirements of pig iron ordered by foundries making even the same grade and weight of castings vary so greatly that blast furnacemen are caused unnecessary trouble when required to make several grades of pig iron for the same weight and grade of castings. The author emphasized that the standard specifications for foundry pig iron of the society, known as A 43-09, have been in general use for about seventeen years with excellent results, and yet there are no definite statements in the specifications of the chemical composition of the foundry pig iron that would guide and assist the foundryman in making light, medium or heavy castings or malleable iron. According to Mr. Webster, all that they have given the foundrymen is a convenient code for writing out a prescription in code words to the blast furnaceman giving the chemical composition of the irons most desirable for the requirements.

The suggestion is made by the author that the present practice of foundrymen and blast furnacemen be tabulated in such a way that a representative standard set of requirements can be agreed upon which will protect fairly the interests of both producers and consumers and that such requirements would form a valuable addition to the society's present specifications. The author quotes from an article in THE IRON AGE, Dec. 1, 1921, by Y. A. Dyer, entitled "Purchasing Foundry Iron by Specification," in which was cited the classifications by analysis of various foundry irons as created by the committee on steel and steel products of the American Iron and Steel Institute during the war.

In a printed appendix to the paper, Dr. Moldenke, chairman of the committee on cast iron, discusses several proposals in Mr. Webster's paper. He offers some changes in the suggested lines for discussion and investigation as contained in the original proposals and states that the discussion of every point included in such a scheme of study would assume the magnitude of a book. He offered as a summary of a life's work in the production of good castings, which are necessarily interwoven with the chemical and physical characteristics of cast iron, the following:

1. Use the best material suited to the production of the castings wanted.
2. Employ correct melting, molding and finishing processes.
3. Gate the molds correctly, so that the good material properly manipulated, may be given the best chance possible to produce good work.

According to Dr. Moldenke, the natural solution of the present conditions, referred to by Mr. Webster, "is to collect the requirements under which pig iron has

been sold for each grade of casting, including steel and malleable, the work to be done by a committee having an equal representation of blast furnacemen, whom we term the producers, and the consumers who manufacture the finished product. If this course is followed, it would enable any blast furnace in the country to produce a much larger output on a given grade of pig iron than ever before, as the number of grades would be reduced and the hair-splitting requirements removed. In dull times, this would enable the furnaces to stock up considerable quantities of each grade of iron with much more certainty than under the present conditions."

Foundry Pig Iron Specifications

The report of committee A-3 on cast iron was then presented by its chairman, Dr. Moldenke. The section of the report referring to specifications for foundry pig iron, A 43-09, adopted in 1904 and revised in 1909, has been brought up-to-date, says the report, by making a few changes found desirable as experience was acquired. Th principal change referred to consists in removing from the original specifications the code already referred to and incorporating it as an appendix to the new proposed tentative specification. Other points in the committee's reports are referred to later on.

The discussion of Mr. Webster's paper and the proposed changes in the specifications for cast iron involved some sharp differences of opinion, particularly from representatives of makers of steel castings. R. A. Bull, J. L. Uhler and J. H. Hall, in particular, said that they were not aware, until a day or so previous to the meeting, that these specifications were intended to include foundry irons used in steel foundry practice, but understood that they applied only to the gray iron foundry. It was their opinion that in their present form the specifications could not be used to purchase iron for certain steel foundry work, particularly acid open-hearth, and for that reason, they did not approve of the adoption of the specifications, if they were intended to include anything else than gray iron foundry pig iron.

G. C. Davies, Philadelphia, chairman of the committee on pig iron, in response to these objections claimed that the specifications were not only intended to apply to all grades of iron used in all kinds of foundry operations but also felt that they were easily adaptable to the ordering of iron for steel foundry as well as gray iron foundry use. Messrs. Hall and Uhler, replied that for converter use a pig iron having a low manganese content was necessary,and a phosphorus and sulphur content not exceeding 0.04 per cent, while for acid open-hearth work a Bessemer pig iron not exceeeding 0.10 per cent phosphorus and a low phosphorus iron not exceeding 0.04 per cent phosphorus and sulphur, as well as a manganese content running from 1 to 1.50 per cent was required. They insisted that it would be impossible to buy such irons under the present foundry iron specifications or, if it were possible, a bonus would be exacted by the producers for certain constituents, such as manganese.

Walter Wood, of R. D. Wood & Co., Philadelphia, impressively stated that he considered that the time for distinguishing various irons by grades had passed and that what was necessary was a set of specifications as elastic as possible. In his opinion the revised specifications as proposed by the committee were the best that could be formulated.

Dr. Moldenke, in reply to some of the foregoing statements, stated that he agreed with some of the objectors and even differed from the chairman of the pig iron committee as to an allowable variation of 0.25 per cent in the silicon content of malleable pig iron, but he felt that the solution of the present difficulty lay in adopting the present report with the understanding that during the coming year the steel foundry and malleable iron interests could formulate their objections or offer specifications more in harmony with their own ideas and present them to the committee for proper consideration and possible further revision next year. With this understanding, the report on foundry specifications, after a division of the vote, was adopted.

Chilled Wheel and High-Test Iron

Two other important matters contained in the report of committee A-3 on cast iron included revisions in the proposed tentative specifications for chilled cast iron wheels, A 46-22 T, and the presentation of new specifications covering what the committee has classified as high-test gray iron castings, which include those irons showing higher strengths than the usual run of iron and more popularly known as semi-steel.

Changes in the tentative specifications for chilled iron wheels were confined chiefly to three points, two of these having to do with chemical composition. In the new tentative specifications, it is stated that the phosphorus content shall not exceed 0.30 per cent and the maximum on sulphur was advanced from 0.17 to 0.18, while under the paragraph dealing with the chilled test, a note is added that the chilled and physical test specified cover only 33-in. wheels of the weights listed, other diameters and weights to be in proportion. It was stated in explanation that the fixing of maximum sulphur at 0.18 per cent was in the way of a compromise as a result of tests made by the Cast Iron Wheel Manufacturers Association. These demonstrated that sulphur is not harmful up to 0.18 per cent or thereabouts, and if limited to 0.17 per cent it would throw out too many good wheels. As to phosphorus, recent physical and thermal tests on a large variety of wheels have shown in some cases that certain wheels crack which are low in phosphorus. J. R. Onderdonk, Baltimore, Md., said that for the size of some wheels now in use, the 250-lb. tup used in the drop tests was altogether too light, some wheels at present in use running as high as 900 lb. and higher.

Wrought Iron

The report of committee A-2 on wrought iron was presented by its chairman, H. C. Smith. It offers minor recommendations for revisions in existing tentative standards for welded wrought iron pipe; for wrought iron forgings for locomotives and cars, and for lap welded and seamless steel and lap welded iron boiler tubes.

In connection with the committee's report, two papers were presented, one by W. M. Myers, general manager Highland Iron & Steel Co., entitled "Merchant Bar Iron Made by the Busheled Scrap Process" and the other by H. S. Rawdon and S. Epstein of the Bureau of Standards, entitled "Some Observations on the Nick-Brand Test for Wrought Iron."

Mr. Myers described the manufacture of merchant bar iron made from re-worked iron scrap or a re-worked mixture of iron and steel scrap in hand busheling furnaces and in mechanical busheling furnaces. Test results were included, together with the physical properties and chemical analysis of the materials. The Rawdon and Epstein paper called attention to the fact that the nick and bend test, as included in specifications for wrought iron, specifies that the materials shall show no crystalline areas or not more than a specified amount, the test being made either by pressure or by blows. The aim of the paper is to show that the usual nick and bend clause is indefinite, since either fibrous or crystalline fractures may be produced according to the procedure followed, including the apparatus used and the way in which the blow is received and the nick is made. Robert Job, Montreal, Canada, pointed to this paper as a good illustration of much of the work done by the Bureau of Standards and contended that decidedly more explicit specifications were needed for wrought iron, particularly as to the crystalline areas resulting from the nick and bend tests.

Symposium on Impact Testing

The entire Wednesday evening session, June 28, was devoted to a symposium on impact testing of materials. It is probably the first symposium of the kind ever attempted; it made a deep impression and was a complete success. In general, it was a review of the development of the impact testing of materials and a discussion of the significance and value of the impact test. There were ten contributions to this symposium. After

a brief preface, the subject was introduced by a résumé of impact testing of materials, including a bibliography and then various papers discussed three phases of the subject: Machines and test specimens used; standardizations of machines and specimens for notched bar impact tests of metals; and the measurement of impact, closing with a paper on the significance of the test.

The contributions to the symposium were published in a pamphlet, ready for distribution at the meeting and containing 107 pages. The symposium was announced as the outcome of an informal discussion in the society's committee E-1 on methods of testing, extending over a period of nearly two years. It was agreed by the committee that steps should be taken by the society to study impact testing of materials more definitely and intensely than heretofore attempted in any concerted way in this country, covering not only details of methods and their standardization, but also inquiring into the significance of such tests. As a result, committee E-1 appointed a sub-committee of 12 members of which T. D. Lynch, Westinghouse Electric & Mfg. Co., was chairman which, in co-operation with the committee on papers, planned the symposium. The publication of the various papers referred to is believed by the committee to comprise the most recent and extensive statement of the status of impact testing of materials and to serve as the start for further study.

Machines for Impact Testing

The résumé and bibliography was prepared by H. L. Whittemore, mechanical engineer Bureau of Standards, Washington. The contributions on machines and test specimens used in impact testing were by D. J. MacAdam, Jr., metallurgist United States Naval Engineering Experiment Station, Annapolis, Md., on "Impact Tests of Metals"; by Thomas R. C. Wilson, engineer in forest products, Forest Products Laboratory, United States Department of Agriculture, Madison, Wis., on "Impact Tests of Wood," and by Earl B. Smith, senior testing engineer, United States Bureau of Public Roads, Washington, entitled "Impact Tests of Road Materials."

Mr. MacAdam, besides describing impact testing machines of various types, as well as a static-resilience testing machine, discussed the relations of repeated impact to single blow impact and the various impact specimens in common use on metals. He also entered into a theoretical discussion of stress distribution in a notched tension specimen and its effect on resilience, as well as other important phases of the subject.

Under the second general division of the symposium, namely, standardization of machines and specimens for notched bar impact tests of metals, one of the most interesting contributions to this symposium was that of C. L. Warwick, secretary-treasurer of the society, Philadelphia, entitled "A Résumé of American Practice in Notched Bar Impact Tests of Metals." The paper is the result of the circulation of a questionnaire among a selected list of testing engineers, laboratories, etc. Mr. Warwick believes the results of the questionnaire point to the desirability of the society's undertaking a suitable study of impact testing in order that methods for such testing shall be prepared, which will compare with the society's methods for tension, compression and other tests of materials.

The brief review of the work on impact testing done by the British Engineering Standards Association was then presented in abstract by Mr. Lynch. It covered the chief features of British practice in the impact testing of notched metal specimens, abstracted from a more complete report of the main committee a year ago by a special committee under the chairmanship of the author. Mr. Lynch summed up with the statement that it is evident that there is a real need for a standardization of the main features of impact testing by the American society, including size and type of specimen, depth of notch and its character, the striking speed and energy and other important details.

Measurement and Significance of Impact

Under the general subject of measurement of impact, three papers were presented, one by C. E. Margerum, metallurgist, United States Naval Ordnance Plant, Charleston, W. Va., who discussed measurement of pressures caused by impact, another by Armin Elmendorf, consulting engineer, Haskelite Mfg. Corporation, Chicago, on "Measuring Forces of Impact," and another by Prof. H. F. Moore on the "Measurement of the Force of Impact by Means of the Elastic Stretch of a Steel Bar."

The symposium was brought to a close by a paper entitled "Significance of the Impact Test" by F. C. Langenberg and N. Richardson, metallurgist and research engineer, respectively, Watertown Arsenal, Watertown, Mass. A brief summary follows:

The authors point out that many attempts have been made to correlate the impact test with other tests and state that it does not appear at the present time that a definite relation between the static tension test and the dynamic impact test exists. Reference is made to attempts of investigators to develop a certain relation between the amount of work done on a given material when broken statically and dynamically. The conclusions are diversified, but the authors believe that the proper conclusion in the light of our present knowledge is that this relationship will vary with the nature of the material.

Regardless of the type of impact machine employed or form of specimen used, the essential result obtained is the amount of energy absorbed by the specimen. In comparing static and dynamic tests, therefore, the same essential data should be recorded in both cases, and the authors point out that in the ordinary static tension tests as it is carried out to-day such data are not recorded and it is therefore impossible to draw any definite relationship between the values usually recorded in the tension test and the data obtained from the impact test. From the large number of tests made at the laboratories at Watertown Arsenal, the authors conclude that the elastic limit and tensile strength of a wide variety of steels, both in the annealed and heat-treated conditions, do not bear any relationship whatever to the work expended in the rupture of Charpy impact test specimens. The percentgae of elongation in tension is low when the Charpy value is low, but it does not follow that when the percentage of elongation is high the Charpy value will be correspondingly high. Typical test data on certain alloy steels and ordnance steels are recorded, illustrating these conclusions and furnishing an opportunity for comparison of static and dynamic tests.

The paper concludes with a brief discussion of the properties revealed by the impact test and the possibilities of interpreting results of the test in engineering practice.

Fatigue of Metals

The major portion of the morning session of Thursday, June 29, was devoted to the subject of the "Fatigue of Metals" with past-president G. H. Clamer presiding. The subject was introduced by a paper entitled "Fatigue or Progressive Failure of Metals Under Repeated Stress" by Profs. H. F. Moore, J. B. Kommers, and T. M. Jasper, University of Illinois, Urbana, Ill. Professor Moore delivered an abstract of the paper, which consists largely of a discussion of the testing practice used in making repeated stress tests, with special reference to the testing machines, the specimens and the methods used in the joint investigation of the fatigue of metals, now in progress under the auspices of the National Research Council, the Engineering Foundation, the General Electric Co., and the Engineering Experiment Station of the University of Illinois.

The authors point out several important conclusions which have been arrived at. One of these is that, for a ferrous metal, there exists a fairly well defined limiting unit stress below which the metal can withstand hundreds of millions of reversals of stress, and that, so far as can be seen, such a metal can withstand an indefinitely larger number of such reversals. For this particular characteristic or limiting stress the term "endurance limit" has been given, and the statement is made that experimental evidence in favor of its existence has been uncovered.

Another feature of this paper is a discussion of the significance of this endurance limit and the presentation of charts showing its correlation with other physical properties. The paper also discusses recent test results of repeated-stress tests. The paper concludes with the following significant statement:

An interesting series of tests is now in progress. Specimens which have withstood 100,000,000 reversals of a stress close to the endurance limit have been subjected to further reversals at slightly higher stresses—in one case 16 per cent higher—and they have withstood without failure a second

run of 100,000,000 reversals of this increased stress. Static tension tests on other specimens which have withstood 100,000,000 reversals of stress close to the endurance limit have given distinctly higher values for tensile strength than those given by tension tests of the material before repeated stressing. These tests are by no means complete, but the possibility that steel may be actually benefited by repeated stressing below the endurance limit is of interest.

Among the numerous lines of possible investigation of the phenomena of repeated stress, two seem to the writers to be worthy of special attention: (1) the extension of investigations of the fatigue strength of non-ferrous metals, with an attempt to see whether they show any phenomena markedly different from those shown by ferrous metals; and (2) an investigation of the strength of steel under repeated stress and at high temperature. There is almost a complete dearth of test data on this second item, and the problem is certainly one of great importance to makers and users of steam turbines and internal combustion engines.

Stress Concentrations and Polarized Light

At the conclusion of the presentation of this paper, A. L. Kimball of the research laboratory of the General Electric Co., Schenectady, N. Y., delivered a brief illustrated address on "Stress Concentrations as Determined by the Use of Transparent Specimens and Polarized Light." Colored slides illustrating the phenomena were shown and were very impressive.

There was also on exhibition three testing machines used by the joint investigation of the fatigue of metals referred to by Professor Moore and brought from Urbana, especially for the purpose. There was a reversed bending machine of the Farmer type; a machine for testing under a combination of reversed-bending and steady tension, and a reversed bending machine adapted either for tests to destruction or for the "rise-of-temperature" test. The latter machine was shown in operation.

A fairly liberal discussion followed the presentation of Professor Moore's paper, several being written. L. E. Tuckerman, Bureau of Standards, Washington, presented an interesting comparison of the work done at Urbana and at Annapolis, laying particular stress upon the specimens of ingot iron used at both places, as being easily comparable, pointing out that the fatigue results obtained at Annapolis are lower than those obtained at Urbana; he raised the question whether the explanation might not be a difference in the surface condition of the specimen used, particularly as affected by rough or smooth tool cuts.

An interesting comparison of certain fatigue tests made on the non-ferrous alloys, duraluminum and a magnesium alloy, as conducted by the Aluminum Co. of America, was presented by R. L. Templin, New Kensington, Pa. The question of the making of fatigue tests of cast iron was suggested as necessary by George K. Elliott, Lunkenheimer Co., Cincinnati, because of the fact that his experience had shown that drop tests, made on two cast irons of practically the same chemical and physical properties, had shown as high as 200 per cent difference in resistance to breaking. C. B. Bronson, New York Central Lines, New York, called attention to some investigations being made by that railroad on the fatigue of steel rails and some other products used in railroad work, with special reference to determining their endurance limit and their improvement, such information being essential for rail steel used in any form of high-speed service on railroad. The discussion was brought to a conclusion by Prof. T. M. Jasper of the University of Illinois, who answered certain questions.

Non-Ferrous Metals and Corrosion

The first session of the convention, Tuesday morning, June 27, was devoted to papers and committee reports on non-ferrous metals and corrosion. It embraced reports of Committee B-1 on copper wire, J. A. Capp, chairman; of Committee B-2 on non-ferrous metals and alloys, Prof. William Campbell, chairman. These reports presented new tentative specifications for brass pipe, copper tubing and admiralty condenser tubes and tentative methods of chemical analysis of brass ingots and sand castings and of bronze bearing metals. They also included tentative revisions in specifications for pig lead and for aluminum for remelting and rolling.

An important paper, "Physical Properties of Some Copper-Silicon-Aluminum Alloys When Sand Cast," by E. H. Dix, Jr., and A. J. Lyon, engineering division, air service, Dayton, Ohio, was presented in abstract. The paper gives the results of an investigation covering alloys of 3, 6 and 9 per cent silicon with 0, 2, 4 and 6 per cent, and with 2 per cent copper and 1 per cent manganese. The metallography of the alloys "as cast" is illustrated in detail and all the results are given in the form of graphs which show that the most desirable compositions lie between 3 to 5 per cent for both copper and silicon. Within these limits alloys can be prepared, the authors say, by simple foundry methods, to show physical properties as good or better than No. 12 alloy and having casting qualities superior to any other aluminum alloy of which the writers have knowledge. "They possess the property of being cast without chills and around steel barrels or hard cores without cracking."

Corrosion

The report of Committee A-5 on corrosion of iron and steel, J. H. Gibboney, acting chariman, consisted of reports of sub-committee II on preservative metallic coatings for metals, of sub-committee III on the inspection of the Fort Sheridan, Pittsburgh and Annapolis tests and sub-committee V on total immersion tests. The report mentions the death during the year of its chairman, Mr. Vorhees, who passed away last September and pays a suitable tribute to his leadership of the committee for seven years.

W. D. Bancroft, professor of chemistry Cornell University, Ithaca, N. Y., in a paper "Preliminary Notes on Corrosion," which is a brief résumé of the corrosion problem, states that he believes measurement of electromotive force is practically valueless from a fundamental viewpoint.

"A Method of Determining the Spelter Coating of Iron and Steel Sheets by Measuring the Rise in Temperature of the Acid Employed," by D. M. Strickland, research engineer, American Rolling Mill Co., describes an accurate method for determining the weight of such coating which is a departure from any method heretofore suggested. A measured volume of hydrochloric acid is poured into a glass tumbler. The temperature of the acid is taken with a thermometer, reading to 0.1 deg. C. The test piece or pieces are dropped into the acid, the galvanized coating is dissolved from the specimens, and the temperature rise recorded. Each one-tenth degree temperature rise equals a definite weight of zinc in grams. Radiation has no influence as the action is completed in possibly 30 sec. All sizes and shapes of galvanized specimens may be used. The equipment is portable and can be used for field tests, the glass container and thermometer taking the place of the laboratory balance heretofore used in making galvanized coating determinations. A table showing results obtained and detailed description of apparatus, application and manipulation are included.

At the conclusion of this session an announcement was made of the election of officers for the next year. This was published in THE IRON AGE, June 29.

Miscellaneous Matters

Steps were put on foot to combine the two committees on coal and coke, Committee D-5 and D-6, the chairmen of which are A. C. Fieldner and Dr. Richard Moldenke, respectively. One session was devoted Thursday afternoon, June 29, to coal, coke, timber, etc., at which revisions in the regular and tentative specifications were discussed. The committee on coal reported that an exhaustive study has shown that it is impracticable to adopt standard specifications for steam coal because of the great variety of coals. The coke committees presented a tentative method for the shatter test for coke, the result of a year's study.

The evening session of Tuesday, June 27, was devoted to the annual address of the president, C. D. Young, and the annual report of the executive committee, reported in brief in THE IRON AGE, June 29. This was followed by an informal dance and smoker.

CONFUSED CONDITIONS

Much Uncertainty Concerning Coal Strike—Little Gain in Loadings

PITTSBURGH, July 3.—Between the efforts of the Government to bring about a conference of the coal mine operators and the officials of the miners' unions, the walkout of the railroad car shop employees and the observance of the Fourth of July holiday, the fuel situation is very much confused. This is not surprising in view of the fact that there are reports that meetings of miners' locals are being held to consider, among other things, an immediate return to work, pending a settlement of the wage scales. This would indicate some progress toward a settlement, but is counterbalanced by suggestions that the Pittsburgh Coal Co. and some of the other operators with mines in the unionized districts in and around Pittsburgh, tiring of the passive policy hitherto pursued, on July 5 would start up several operations on an open shop basis.

Since a week ago there has been no appreciable gain in the loadings of coal in western Pennsylvania; indeed, as indicating the unrest which still exists in this district, several mines which had resumed have gone down again. The walkout of the railroad shop employees is associated with the coal strike in that it appears to have strengthened the will of the miners to stay out, and, of course, the Fourth of July observance has been the occasion of a good many staying away from work until after that holiday.

The supply situation is tighter than it has been recently and probably will remain so at least over the present week. Local non-union coal now is quoted at $4 minimum, and the few small lots of lump gas coal coming out of local mines command $5 per net ton at mines. Southern coal is priced at $3.50 to $3.75, beehive oven coke is extremely scarce this week and quotable anywhere from $8 to $10 per net ton at oven.

Keen Interest in Washington Conference

UNIONTOWN, PA., July 1.—Considerable interest in the Connellsville bituminous region now is centering on the outcome of the negotiations between union representatives and coal operators called to Washington by President Harding. Just how a successful outcome of such negotiations would affect the local region is being studied. The Connellsville region has never been unionized. The operators have never had any dealings with the unions. Since the sympathetic strike developed in the region union locals were organized at many plants, but these have had no relations with the operators. It is almost a certainty that the union will not be recognized in the Connellsville region. Should the strike be settled and the union men return to work, what will happen to the men who have joined the union in this region? What support will the union give them or will they be allowed "to hold the bag"? These questions are being asked with no answers given.

Union organizers have been busy this week. From one to four meetings a day have been held all week, at which the organizers are understood to have devoted much of their attention to discussing the probable results of the Washington conference and predicting a successful outcome of the strike—but not stating in what way it will be successful.

The sheriff, following disorders of a minor character, issued a ban on meetings within a mile of operating mines. One meeting in the county this week was entirely broken up when the strikers showed some signs of surliness when told to move on. Several other meetings were held after they had been moved outside the limits prescribed.

Beating up of a working miner in Brownsville, not the first such occurrence, resulted in the sheriff and State police taking over police powers in the three river towns.

The union got a foothold at Leisenring No. 2 of the H. C. Frick Coke Co. this week, causing a drop in production at that plant, although failing to bring about an entire suspension of operations.

Hundreds of men have come into the Connellsville region during the past fortnight, bringing production up noticeably. Scores of miners have moved from one plant to another where they have gone to work. To date it is estimated that there have been some 500 eviction notices, possibly 600, served on strikers in the region. In most of these instances their houses are now occupied by men who have come into the region. Many of the evicted families are now living in tents, and in some sections small tent colonies have appeared.

The H. C. Frick Coke Co. production showed an increase of some 1000 tons a day over the preceding week. Production this week, it is estimated, will show an increase of 600 to 700 tons a day over last week.

Mineral Section Added to Iron and Steel Division

Inquiries regarding minerals are coming to the Iron and Steel Division of the Bureau of Foreign and Domestic Commerce in such increased volume that its scope has been enlarged by having a mineral section added to it and placed in charge of James A. Stader, of Joplin, Mo., an experienced man in mineralogy. Being a part of the Iron and Steel Division, the section will be under the supervision of Luther Becker, chief of the division. Mr. Stader took up his duties on July 1.

J. A. STADER

The Mineral Section will handle all minerals, metallic and non-metallic, excepting fuels, iron ore and such ores and ferroalloys as are intimately associated with iron and steel. The section will pay particular attention to refractories and the major metals with which it will deal will include copper and alloys of bronze and brass and their products; lead, zinc and tin and their manufactures. The refractories materials will involve such products as fire clay, magnesite, chrome, and silica brick and clay products except earthenware and pottery. Other products include abrasive, cement, sand, tiling for construction purposes and gold and silver, excepting their financial aspects.

Mr. Stader was selected to take charge of the section because it was considered advisable to find a man not only possessed of a thorough knowledge of the work, but also because of his actual foreign experience in mining and investigation and his acquaintance with economic conditions abroad as they apply to minerals and their production. Mr. Stader is a graduate chemical engineer of the class of 1906 of the University of Missouri. In that year, he did mining work in Mexico. Later he became chief engineer of the Eagle Pitcher Lead Co., Joplin, and subsequently was made a member of the Central European Industrial and Mining Commission, under the Supreme Council created by the armistice agreement. As a member of the commission, Mr. Stader was stationed first in Moravia and upper Silesia. He traveled extensively in connection with his work through various mineral producing European countries.

Production of the Ford Motor Co. for May is reported by *Automotive Industries* at 144,469, which included 134,222 Ford cars and trucks, 602 Lincoln cars and 9105 tractors. Of the Ford cars and trucks, 6579 were Canadian and 7170 for export. Tractors for ex-

An involuntary suit in bankruptcy has been filed against the Cedar Rapids Foundry & Machine Co., Cedar Rapids, Iowa.

Reduced Railroad Rates Effective July 1.

The railroads have not yet issued tariff supplements containing new freight rates in effect July 1, except in a few scattering instances. The following rates are substantially correct. In some instances, the announced rates will be different to the extent of a cent or two, according to the construction placed upon the rule as to figuring new rates. For example, the rate on pig iron from the valleys to Pittsburgh figures $1.764. When finally issued, this may be $1.76 or $1.77.

Finished Material

(Per 100 Lb., Carload Lots)

Pittsburgh to		*Pittsburgh to*	
Philadelphia	$0.325	Kansas City	$0.735
Baltimore	0.315	St. Paul	0.595
New York	0.34	Omaha	0.735
Boston	0.365	Omaha (pipe)	0.705
Buffalo	0.265	Denver	1.275
Cleveland	0.215	Denver (pipe)	1.215
Cleveland, Youngstown, combination rate	0.19	Pacific Coast	1.50
		Pacific Coast, ship plates	1.20
Detroit	0.295	Birmingham	0.69
Cincinnati	0.295	Memphis	0.385
Indianapolis	0.31	Jacksonville, all rail	0.50
Chicago	0.34	Jacksonville, rail and water	0.415
St. Louis	0.43	New Orleans	0.515
Kansas City (pipe)	0.705		

Pig Iron

(Per Gross Ton)

Buffalo to		Elgin, Ill.	0.88
Boston (all New England)	$4.92	Joliet, Ill.	0.63
New York	4.92	Milwaukee, Wis.	0.755
Philadelphia	4.92	Racine, Wis.	0.755
Pittsburgh	3.275	Kenosha, Wis.	0.755
Albany	2.27	Waukesha, Wis.	0.755
Syracuse	1.89	Janesville, Wis.	1.385
Rochester	1.385	Beloit, Wis.	1.385
Youngstown to		Madison, Wis.	1.64
Pittsburgh	1.77	Sheboygan, Wis.	1.945
Cleveland	1.77	Minneapolis, Minn.	3.04
Canton, Ohio	1.77	St. Paul, Minn.	3.04
Warren, Ohio	0.76	Michigan City, Ind.	1.385
Chicago	4.79	South Bend, Ind.	1.89
Indianapolis	3.66	Kokomo, Ind.	2.645
St. Louis	5.80	Benton Harbor, Mich.	2.61
Cincinnati	3.66	Muskegon, Mich.	3.025
Boston	6.43	Grand Rapids, Mich.	3.025
New York	6.03	Kalamazoo, Mich.	2.645
Baltimore	5.43	Jackson, Mich.	3.025
Philadelphia	5.63	Lansing, Mich.	3.15
Virginia to		St. Louis, Mo.	2.16
Philadelphia	5.17	Des Moines, Iowa	4.15
Brooklyn and Jersey City	5.28	Omaha, Neb.	5.47
Boston	5.64	Batavia, Ill.	0.88
Birmingham, Ala., to		Chicago Heights, Ill.	0.63
Cincinnati	4.05	Geneva, Ill.	$0.88
Louisville	3.72	Carpentersville, Ill.	1.01
Columbus, Ohio	5.40	Danville, Ill.	1.64
Indianapolis	5.29	Belvedere, Ill.	1.385
Chicago	6.00	Sterling, Ill.	1.385
Cleveland	6.00	Galesburg, Ill.	1.745
Boston, rail and water	6.91	Quincy, Ill.	1.745
Boston, all rail	9.61	La Porte, Ind.	1.745
Philadelphia, rail and water	6.67	Terre Haute, Ind.	2.645
Philadelphia, all rail	7.81	Indianapolis, Ind.	2.645
Pacific Coast	22.40	Mishawauka, Ind.	1.89
Omaha	8.17	Battle Creek, Mich.	3.025
St. Louis	5.17	Appleton, Wis.	1.945
Chattanooga	1.02	Fond du Lac, Wis.	1.945
Ironton and Jackson to		Green Bay, Wis.	1.945
Cincinnati	2.27	La Crosse, Wis.	2.31
Cleveland	3.02	Winona, Minn.	2.31
Detroit	3.28	Duluth, Minn.	3.76
Chicago	4.79	Dubuque, Iowa	1.745
From Chicago to		Cedar Rapids, Iowa	3.04
Rockford, Ill.	1.385	Charles City, Iowa	3.04
Freeport, Ill.	1.385	Waterloo, Iowa	3.04
Rock Island, Ill.	1.745	Ottumwa, Iowa	3.645
Moline, Ill.	1.745	Marshalltown, Iowa	4.01
Davenport, Iowa	1.745	*To Chicago from*	
Kewanee, Ill.	1.745	Birmingham, Ala.	6.00
Peoria, Ill.	1.745	Ironton, Ohio	4.79
Aurora, Ill.	0.88	Jackson, Ohio	4.79
Wells and Marquette, Mich.	3.04	Mahoning Valley	4.79
Cadillac and Antrim, Mich.	3.15	Shenango Valley	4.79
Boyne City and East Jordan, Mich.	3.275	Granite City, Ill.	2.16
To New York from		Sault Ste. Marie, Ont.	3.645
East. Pennsylvania	2.27		
Buffalo	4.92		
Virginia	5.54		
To common New England points			
From Eastern Pennsylvania	3.65		
From Buffalo	4.92		
From Alabama	9.60		
From Cleveland to			
Akron	1.64		
Barberton	1.64		
Bucyrus	2.02		
Canton	1.77		
Columbus	2.27		
Dover	1.77		
Dayton	2.52		
Erie	1.77		
Elyria	1.77		
Lima	2.39		
Mansfield	2.27		
Newark	2.27		
Painesville	1.77		
Ravenna	1.64		
Salem	1.77		
Springfield	2.39		
Valley points	1.77		
From Toledo to			
Bucyrus	1.77		
Columbus	2.27		
Mansfield	2.27		
Springfield	2.40		
Dayton	2.40		
Indianapolis, Ind.	2.90		
Ft. Wayne, Ind.	2.27		
Marion, Ind.	2.65		
South Bend, Ind.	2.90		
Detroit	1.39		
Jackson, Mich.	1.77		
Lansing, Mich.	2.02		
Saginaw, Mich.	2.52		
Bay City, Mich.	2.52		
Pontiac, Mich.	1.64		
From Eastern Furnaces to Philadelphia:			
Virginia (all furnaces)	$5.17		
Swedeland	0.76		
Pottstown	1.14		
Birdsboro	1.14		
Coatesville	1.14		
Reading	1.14		
Bethlehem	1.26		
Sparrows Point, Md.	1.64		
Catasauqua	1.39		
Parryville	1.39		
Hokendaqua	1.39		
Hellertown	1.39		
Alburtis	1.39		
Robesonia	1.39		
Emporium	3.54		
Wharton, N. J.	1.64		

New Steel Rails

(Per Gross Ton)

Pittsburgh to		*Pittsburgh to*	
New York	$5.17	Boston	$5.67
Philadelphia	4.92	Chicago	5.42
Baltimore	4.79	St. Louis	6.18

Billets, Wire Rods, Etc.

(Per Gross Ton)

Pittsburgh to		*Pittsburgh to*	
New York	$5.67	Boston	$6.18
Philadelphia	5.17	Chicago	5.42
Baltimore	4.92	St. Louis	6.81

Coal Freight Rates

To Eastern Points, per Gross Ton	Originating District — Connellsville Westmoreland Pittsburgh	Fairmont	Greensburg	Latrobe
Baltimore	$3.22	$3.09	$2.95	$2.86
Chester, Pa. (PRR)	2.22	3.09	2.95	2.86
Chester, Pa. (P&R)	3.35	3.21	3.08	2.99
Harrisburg, (PRR & P&R)	2.72	2.58	2.45	2.36
Johnstown, Pa. (B&O)	1.39	1.39		
*Johnstown, Pa. (PRR)	1.64	1.64		
Lebanon, Pa. (PRR & P&R)	3.10	2.96	2.83	2.74
New York (37th St.)	3.47	3.34	3.20	3.11
Brooklyn	3.60	3.47	3.33	3.24
Philadelphia	3.22	3.09	2.95	2.86
Sparrows Point	3.22	3.09	2.95	2.86
Steelton, Pa.	2.72	2.58	2.45	2.36
South Bethlehem, Pa.	3.35	3.21	3.08	2.99
Syracuse, N. Y.	3.35	3.21	3.08	2.99

*The rate from points on the Monongahela Railway in the Fairmont group south of the Pennsylvania state line to Johnstown is $1.96 per net ton. Rates to Johnstown from Greensburg and Latrobe groups apply specifically from point of origin to destination.

The Connellsville rate applies to shipments from points

on the Southwest Branch of the Pennsylvania Railroad south of Ruffsdale, from points on the Pittsburgh, Virginia & Charleston and points on the Monongahela River railroad.

The Fairmont rate on shipments via the Baltimore & Ohio applies to shipments from points East of Suterville, Pa., from points on the Smithfield & Masontown Branch and from the Fairmont Region of West Virginia.

To Western Points, per Net Ton	Originating District — Pittsburgh Group	Upper Connellsville	Lower Connellsville
Canton, Ohio	$1.60	$1.65	$1.80
Chicago	3.09	3.09	3.09
Cleveland	1.85	1.90	1.98
Columbus, Ohio	1.89	2.02	2.04
Detroit, Mich.	2.58	2.58	2.58
Indiana Harbor, Mich.	3.09	3.09	3.09
Toledo, Ohio	2.39	2.39	2.39
Youngstown, Ohio	1.35	1.42	1.64
Lake Ports	1.67	1.73	1.81
To Canadian Basing Points:			
Port Maitland, Ont.	2.26	2.39	2.39
Buffalo	2.25	2.39	2.39

These rates apply in a general way to shipments from the territory described. There are, however, numerous extensions to the specific rates quoted and in each case before applying the rate as a basis for freight charges, the shipper or consignee should determine the exact location of the mine from which the business will move; then refer to the tariff naming the rate in question.

The Pittsburgh district includes points East as far as Latrobe and South on the Southwest Branch to and including Ruffsdale; South to, but not including, Brownsville on the Pittsburgh, Virginia & Charleston railroad; eastward to Dawson on the Baltimore & Ohio railroad and eastward to Dickerson Run and Southwest to and including Brownsville on the New York Central lines.

The Connellsville district includes points on the Southwest Branch of the Pennsylvania railroad South of Ruffsdale; on the Pittsburgh, Virginia & Charleston, except Braznell and all Monongahela River railroad points; New York Central points East of Dickerson Run, including Connellsville Transfer and points on the Baltimore & Ohio, Dawson to Point Marion, Pa.

Coke

(*Per Net Ton*)

Connellsville, Pa., to		*Connellsville, Pa., to*	
Baltimore	$3.21	Pittsburgh	$1.51
Buffalo	3.28	Port Henry, N. Y.	4.54
Canton, Ohio	2.52	Port Maitland, Ont.	3.28
Chicago	4.16	Pottstown, Pa.	3.40
Cleveland	2.77	Reading, Pa.	3.28
Columbus, Ohio	2.77	Richmond, Va. (B. & O.)	4.70
Detroit	4.65	Richmond, Va. (P. R. R.)	4.79
East St. Louis	4.54	South Bethlehem, Pa.	3.53
Erie, Pa.	2.77	Swedeland, Pa.	3.53
Harrisburg	2.90	Toledo	3.28
Joliet, Ill.	4.16	Wheeling	2.27
Louisville	4.16	Valley points	2.27
Milwaukee	4.79		
New York	3.91		
Philadelphia	3.53		

Iron Ore

(Per Gross Ton)
(From lower lake ports)
Direct Ore

Rail of vessel to car	
Handling charge	$0.08
Line haul to	
Mahoning and Shenango valleys	0.82
Dover, Ohio, district	0.88
Midland, Pa., district	0.99
Pittsburgh district	1.15
Jackson, Ohio, district (Toledo)	0.90
Jackson, Ohio, district (Cleveland)	1.12
Ironton and Hamilton, Ohio, districts	1.25
Johnstown, Pa., district	1.30
Lehigh valley district	1.94
Sparrows Point, Md.	1.99

Dock Ore

In addition to line haul	
Rail of vessel to dock pile	0.20
Dock pile to car	0.13
Storage charge per ton per month	0.01

Mines to Upper Ports

The new freight rates on Lake Superior ore from the mines to the upper lake ports which became effective June 19 representing practically a 10 per cent reduction are as follows, the rates named including unloading charges:

Marquette from Eastern Marquette range	$0.69
Marquette from Western Marquette range	.78
Escanaba from Menominee and Marquette ranges	.91
Ashland from Gogebic range	.91
Duluth and Superior from Mesabi Range	.91
Two Harbors from Vermillion range	.91
Duluth and Superior from Cuyuna range	.91

SOUTHERN COMPLAINTS

Hearing of Pittsburgh Boring Case Held at Chattanooga

CHATTANOOGA, TENN., July 3.—Several Birmingham steel fabricators appeared before Federal Trade Commission Examiner J. W. Bennett in Chattanooga last week presenting argument against the Pittsburgh plus plan of basing steel prices. Interesting testimony was that of R. I Ingalls, of the Ingalls Iron Works, structural steel operator. Mr. Ingalls said the territory of his company included the states of North and South Carolina, Georgia, Florida, Louisiana, Mississippi, Alabama, Tennessee and Virginia, and included exports to Cuba, South America, Philippines and other points. He said as a general rule a differential of $5 a ton is being added by the Tennessee company to the Pittsburgh price, but this is not always the case. In highly competitive jobs, where the Tennessee company desires the business, lower prices are made. He said his business would be much curtailed if full Pittsburgh base plus freight were charged. If there were no differential, Mr. Ingalls said his trade territory would be widened. Concessions have enabled him to go into Virginia and North Carolina. He purchases 80 to 90 per cent of the 20,000 to 25,000 tons of steel consumed in his plant per annum in Birmingham. The Fairfield plant of the Tennessee company, which was built in 1919, has materially assisted in the expansion of his business.

Frank J. Ridout, of the Perfection Spring & Mattress Co., Birmingham, said he paid Pittsburgh price plus the freight from mill to Birmingham for steel for bed springs purchased of a maker other than the Tennessee company. He claimed that on account of this disadvantage bed spring makers in Wisconsin, St. Louis and other distant points competed with him in local territory. He said if the full Pittsburgh price plus freight from Pittsburgh were charged, it would put him out of business.

Harold M. Thompson, of Johnson & Thompson, Birmingham, structural steel operators, specializing in manufacture of tanks, said the operation of his plant was much restricted by the differential. He said the American Bridge Co. could get in wherever it wished irrespective of destination. He declared his company could not compete with Northern operators to the same degree that they compete with him in Birmingham district and adjacent territory.

Francis M. Herring, of the Scofield Sons Co., Macon, Ga., maker of boilers and tanks, said a real Birmingham production cost selling price would extend the competitive area of all Southern manufacturers by allowing them to sell in what naturally, by geographical and fundamental transportation factors, would seem to be their logical right. This would result in less keen competition in what is now the restricted area of Southern factories, as all would share in the benefits of increased volume of business through larger area of sales. This, in turn, would result in lower overhead expenses, which would be reflected in lower selling prices to the ultimate benefit of the consumer.

J. F. Baker, of Sanford-Day Iron Works, Knoxville, said he is limited to Kentucky, Tennessee and Virginia in sales of complete mine cars. On car trucks alone, bodies to be supplied by some other manufacturer, he can compete even in the Pittsburgh district, because he gets his pig iron in Birmingham at Birmingham production price. He sells the trucks pretty well over the country by reason of getting the iron so advantageously.

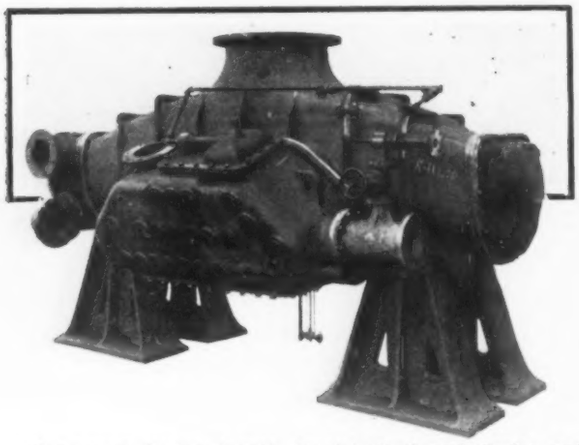
Testimony as to disadvantages of the Pittsburgh plus selling price base were also given by officials of the Vulcan Rivet Works, Birmingham, and others.

Surface Condenser with Separate Cooler

In the accompanying illustration is a shop view of one of the smaller of the new type of surface condenser units developed by the Ingersoll-Rand Co., New York, and built to serve a 600-kw. turbine.

An interesting feature is the separate cooler mounted on the shell, as shown. This is intended to devaporize thoroughly the air and vapors before they are finally drawn off by the vacuum equipment. Air is withdrawn by a steam jet vacuum pump in combination with a small secondary reciprocating pump. The primary steam jet is mounted on the cooler dome and the secondary jet on the tee, shown. The secondary vacuum pump takes its suction from the open end of the tee. The condensate and circulating water pumps are Cameron centrifugal motor-driven units.

The new type condenser is characterized by the special shell and cooler design combined with an



Condenser Designed with Special Shell and Cooler and with Tubes in Stages, to Eliminate Waste Tubes and Reduce Surfaces

arrangement of tubes in "stages" which is said to result in the practical elimination of waste tubes and a condenser of greatly reduced surface. The surface may be still further reduced by the use of high water velocities, which it is urged, are of benefit in alleviating corrosion and fouling.

Elimination of waste tubes is secured by arranging the tubes in "stages," by correct shell shape, and by the use of a separate devaporizer-cooler. The tubes, spaced on wide centers in the top of the shell, are brought closer together in each lower bank or stage. The shell itself is gradually narrowed from its width at the top to that of a nozzle running the length of the shell under the last row of tubes, giving it the characteristic heart-shaped section. Sufficiently high steam velocities to sweep condensate and air films from the tubes are maintained throughout the condenser by this construction, which compensates for the decreased volume of the steam as it is condensed in its passage down over the tubes. The residual air and steam from the last row of tubes is drawn up into the cooler which is mounted on the side of the shell proper and fitted with cast iron cooling grids whose surfaces are particularly adapted to devaporize and cool the air before it passes to the vacuum pump. The withdrawal of the non-condensibles at the bottom of the shell and the use of a multi-stage tube arrangement and correct shell shape is said to assure active flow of steam over every tube and preclude pocketing and stagnation.

The elimination of waste tubes in this way is claimed to result in a large saving in maintenance and renewal costs.

The number of holders of United States Steel common stock at closing of books for June dividend was 99,512, the lowest figure since December, 1920, and comparing with 106,811 in March, a decrease of 7299 in three months. Preferred stockholders at closing of books for May dividend numbered 81,446, compared with 81,865 in February and 81,621 in November, 1921.

Adoption of Uniform Cost Accounting

WASHINGTON, July 4.—Malleable castings, pressed steel, steel barrels and power piping and stoves are included among approximately 120 commodity lines which have adopted uniform cost accounting methods, according to a survey just completed by the Fabricated Production Department of the Chamber of Commerce of the United States. A statement issued by the department says that 40 lines have gone the whole distance in adoption of uniform cost systems and in securing general use of them in their industries. About the same number have adopted complete uniform methods and are now facing the important problem of installing such systems, while the remainder have only worked out plans for simplification of accounts.

While making the survey the department received scores of letters from trade associations and individual manufacturers pointing out the benefits of uniform cost accounting. Some of the advantages enumerated are:

It strengthens position of industry in dealing with Governmental or regulatory bodies.

It inspires confidence that selling prices are determined upon a fair and equitable basis.

It solves disputed points of accounting within the industry authoritatively.

It makes possible a more intelligent competition.

It reveals lines within the industry which have been marketed on an unprofitable basis.

It shows the danger line below which goods cannot be sold at a profit, thus serving as an insurer of profits.

It acts as a common guide to the value, efficiency and waste of workers, machines, methods, operations and plants.

It becomes a reliable guide and basis for estimating prospective business, thus acting as a forerunner for comprehensive production statistics.

It furnishes current reports for comparing major cost items with standards, which are predetermined and thereby measuring and increasing operating efficiency.

It establishes a standard code of accounting practice, so that if your cost clerk or bookkeeper leaves you, his successor will step into a system whose operation has been fully and completely formulated.

In announcing the result of the investigation the department let it be known that it stands ready to suggest the various means by which interest in cost methods can be so aroused that manufacturers will demand uniform cost accounting, rather than have it thrust upon them.

To illustrate what is meant by a uniform cost system the department analyzes some of the systems actually in operation. It calls attention to the flexibility and their adaptability to accounting in the particular industry. The following analysis is made of uniform cost accounting as it applies to malleable castings:

Classification of accounts and departmentalization of industry.
Standard definition of cost accounts.
A method of distributing fixed plant charges.
Standard practice covering the treatment of cost of metal, melting expense and the distribution of indirect costs
How to arrive at the cost of metal poured.
Standard forms and statements:
- Distribution of fixed plant charges.
- Analysis and distribution of pattern shop costs.
- Statement of iron costs.
- Monthly cost statement.
- Statement of metal, melting and overhead rates.
- Casting summary cost record.
- Casting cost record.

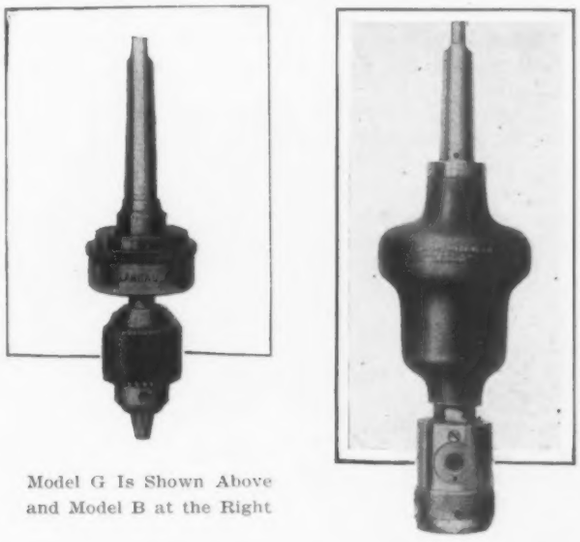
The following are among the associations which, the statement of the department says, have applied themselves earnestly to the establishing of a more uniform cost system: American Foundrymen's Association, American Malleable Castings Association, National Association of Brass Manufacturers, National Association of Stove Manufacturers, National Machine Tool Builders' Association, National Implement and Vehicle Association, Pressed Metal Association, Steel Barrel Manufacturers' Association.

Examinations for valuation engineer in general mining, coal mining, oil and gas and the forest industry are announced by the Civil Service Commission, Washington. The salary is $3,600 to $4,800 per year. Applicants should apply for form 1312. Papers will be rated as received, up to Sept. 1.

Plain and Back Geared Tapping Chucks

The accompanying illustrations show a group of tapping chucks recently placed on the market by the Landau Machine & Drill Press Co., 45 West Eighteenth Street, New York.

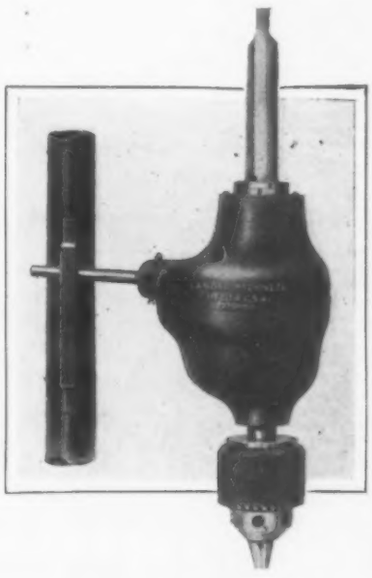
The chuck at the left, known as model G, is a friction tap holder which can be used with type B and E, also shown. It is made in three sizes and two styles, one style having a taper shank for use on a drill press or in the tailstock of a lathe, the other style having a straight shank with reversing sleeve for use in the turret head. The reversing sleeve can be furnished in any diameter from 1 in., minimum. Model B is a single-spindle tapping chuck which is driven from the main spindle of a drill press. It is



Model G Is Shown Above and Model B at the Right

equipped with ball bearings and reverses at higher speed than when tapping. The capacity of the model B chuck is up to ¼ in.

The model E, shown below, is a single-spindle back-geared tapping chuck, in which the ratio of reversing to tapping speed is 5 to 1. It is made for a No.'s 1 or 2 Morse taper and the capacity is for taps up to 7/16 in. The main drive is fitted with ball bear-



Back Geared Tapping Chuck, Model E. The ratio of reversing speed to tapping speed is 5 to 1

ings and a standard chuck is used. The body or housing is comparatively small for a tapper of this capacity, the compactness being attributed to the back gear design. There are no protruding screws. The speed and special clutch design are said to result in greatly preventing tap breakage. The clutch will release on undue strain.

A model F, not shown, is similar to the model E, except that it has a tapping ratio of 3 to 1, the reverse speed being three times the tapping speed, and a capacity of from ⅜ to 1⅛ in.

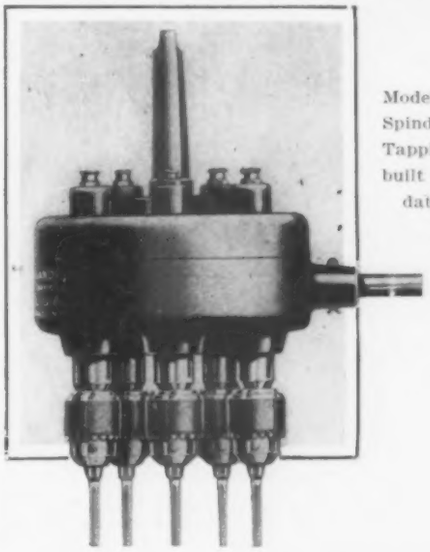
Back-Gear Tapping and Drilling Head.

A multiple spindle back gear tapping head, shown in the separate illustration, designated as the model H, is built to accommodate up to five spindles. The spindles are equally spaced about the circumference of a circle and the distance from the center of the driving spindle to the center of the tap is 2½ in. The main drive spindle is mounted on ball bearings. The tapping ratio is 4 to 1, the reversal being the faster. A standard drill chuck is used and essential parts are hardened and are interchangeable. The capacity is up to ¼ in. Clutches disengage when too great a strain is placed on the taps, which can be fed to the bottom of the hole, stopping automatically when meeting with an obstruction.

A multiple drilling head, known as the model K, is made for use in conjunction with the model H tapper. It is essentially of the same design, but is without the reversing mechanism. The main drive is fitted with ball bearings and the drilling spindles have standard taper shanks, also fitted with ball bearings.

Plants of Aluminum Mfrs. Leased

At a meeting of the stockholders of the Aluminum Mfrs., Inc., held in Cleveland, June 29, the proposed lease of the plants of the Aluminum Mfrs., Inc., to the Aluminum Co. of America, Pittsburgh, for a period of



Model H Multiple Spindle Back Gear Tapping Head. It is built to accommodate up to five spindles

25 years, was approved by the unanimous vote of the stockholders present. The Aluminum Mfrs., Inc., has plants in Cleveland, Detroit, Buffalo and Fairfield, Conn., for the manufacture of aluminum castings and forgings. For a number of years the Aluminum Co. of America has owned approximately a 50 per cent interest in the plants of the Aluminum Mfrs., Inc. The company has a stock issue of $5,000,000 in preferred stock and 325,860 shares of no par common stock. Under the terms of the lease the Aluminum Co. of America will pay rental sufficient to pay dividends on the preferred stock of the Aluminum Mfrs. and to retire a portion of this stock as provided under the charter and also sufficient to pay approximately $2 per share on common stock after 1926. No change is expected in the management of the plants of the Aluminum Mfrs., Inc., as a result of the lease. The officers of this company are: W. P. King, president and treasurer, George J. Stanley, vice-president in charge of production, and John H. Watson, secretary.

The Brier Hill Steel Co., Youngstown, is erecting a six-story office building on West Federal Street, opposite its open-hearth furnace department. The building will house the company's executive, accounting and operating officers and staffs.

Iron and Steel Exports Gain Heavily

Highest Exports Since March, 1921—Rails, Black Sheets, Structural Shapes, Pipe and Wire Share in Increase—Imports Higher

WASHINGTON, July 3.—Exports of iron and steel in May, amounting to 230,062 gross tons, valued at $29,456,349, brought the total to the pre-war monthly average and at the same time showed a sharp recovery over the April total, which aggregated 198,830 tons, valued at $17,563,662. For the 11 months ending with May of the current year the total was 1,498,993 tons, valued at $281,735,991, as compared with 4,117,239 tons valued at $739,214,697 for the corresponding period one year ago. The May movement of this year was the largest since March of last year, which exceeded it only slightly, amounting to 230,635 tons.

Imports of iron and steel and of manganese ore as well as exports of machinery also showed gains in May. Imports of iron and steel aggregated 23,093 tons valued at $2,966,332, as compared with 18,417 tons valued at $2,888,790 in April. For the 11-month period ending with May, the total of imports amounted to 147,391 tons valued at $95,955,369, as compared with 246,336 tons valued at $41,696,151 for the corresponding period of last year. Imports of manganese ore in May aggregated 46,517 tons, valued at $307,571, as compared with 25,559 tons valued at $133,715 in April; for the 11-month period the total was 212,879 tons, valued at $1,226,133.

Exports of machinery in May were valued at $19,415,994, as compared with $19,191,148 in April. For the 11-month period the total value was $222,427,107. The largest machinery items exported in May were textile equipment and agricultural machinery, which amounted to $1,520,512 and $1,603,574, respectively. The exports of lathes were valued at only $66,604.

Exports of Iron and Steel—Gross Tons

	May		Eleven Months Ending May	
	1921	1922	1921	1922
Pig iron	2,541	3,897	123,992	26,334
Ferromanganese	.....	41	3,335	966
Ferrosilicon	2	42	525	405
Scrap	4,146	12,804	178,891	52,136
Ingots, blooms, billets, sheet bar, skelp	749	13,091	81,443	49,949
Iron and steel bars	5,905	26,544	499,138	83,106
Alloy steel bars*	.....	174	.....	4,444
Wire rods	2,642	4,367	61,075	37,558
Plates, iron and steel	18,518	16,879	753,222	110,007
Sheets, galvanized	3,042	9,487	90,211	71,544
Sheets, black steel	7,686	34,619	145,533	275,505
Sheets, black iron	1,264	584	24,451	5,918
Hoops, bands, strip steel	915	2,539	37,128	22,001
Tin plate, terne plate, etc.	1,593	6,291	175,551	70,391
Structural shapes, plain material	17,926	18,132	508,424	107,224
Structural material, fabricated	419	4,242	30,138	20,901
Steel rails	23,492	23,812	529,252	196,490
Rail fastenings, switches, frogs, etc.	289	3,011	13,520	18,587
Boiler tubes, welded pipe and fittings	41,312	15,589	418,631	143,139
Cast iron pipe and fittings	4,124	2,709	72,411	24,691
Plain wire	2,961	12,836	163,328	72,567
Barbed wire and woven wire fencing	1,027	7,791	85,180	33,538
Wire cloth and screening*	.....	143	.....	452
Wire rope and cable*	.....	343	.....	.....
Wire nails	709	5,797	71,761	46,611
All other nails and tacks	191	810	12,872	6,213
Horseshoes	12	109	1,472	653
Bolts, nuts, rivets and washers, except track	1,286	1,313	35,988	12,752
Car wheels and axles†	.....	686	.....	.....
Iron castings†	.....	972	.....	4,504
Steel castings†	.....	204	.....	.....
Forgings†	.....	187	.....	.....
Machine screws†	.....	17	.....	75
Total	142,551	230,062	4,117,239	1,498,993

*Not reported separately, prior to January, 1922.
†Previous to January, 1922, reported by value only.

Imports of Iron and Steel—Gross Tons

	May		Eleven Months Ending May	
	1921	1922	1921	1922
Ferromanganese	75	5,213	42,932	17,624
Ferrosilicon	182	588	6,841	9,493
Pig iron	15,276	4,476	60,471	34,622
Scrap	824	7,292	81,285	40,969
Steel bars	75	1,053	4,177	4,485
Bar iron	314	49	3,782	2,651
Structural steel	72	237	1,322	1,371
Billets, without alloys	.....	823	750	10,963
All other billets	117	180	3,165	941
Steel rails	6,254	2,962	34,998	22,519
Sheets and plates	359	34	1,548	305
Tin and terne plates	14	84	477	292
Wire rods	11	102	4,588	1,156
Total	23,573	23,093	246,336	147,391
Manganese ore and oxide	54,663	46,517	665,601	212,879

MACHINERY EXPORTS
By Value

	May, 1921	May, 1922	Eleven Months Ending May, 1921	Eleven Months Ending May, 1922
Locomotives	$2,647,441	$278,167	$42,313,209	$17,350,752
Other Steam Engines	27,126	9,323	478,419	51,064
Boilers	236,678	55,252	8,684,615	1,351,775
Accessories and Parts	.....	717,028	.....	*482,036
Automobile Engines	248,637	616,128	2,536,811	3,124,168
Other Internal Combustion Engines	403,136	302,707	9,839,550	2,756,703
Accessories and Parts for	.....	509,802	.....	*1,116,771
All Other Parts of Engines	766,249	.....	19,650,065	†3,251,595
Complete Tractors, except Agricultural	35,344	2,435	19,673,608	257,280
Electric Locomotives	274,511	.....	572,982	†1,339,190
Other Electric Machinery and Apparatus	2,132,800	875,694	33,906,464	14,774,031
Excavating Machinery	348,335	.....	2,632,008	†710,339
Concrete Mixers	25,116	39,596	982,924	365,991
Road Making Machinery	109,995	.....	1,100,736	†414,539
Elevators and Elevator Machinery	155,842	.....	1,935,319	†552,821
Mining and Quarrying Machinery	688,326	380,930	9,141,903	3,923,915
Oil Well Machinery	1,039,667	.....	10,773,031	†3,146,283
Pumps	743,498	425,405	15,976,426	5,079,950
Lathes	269,835	66,604	5,244,550	961,285
Boring and Drilling Machines	.....	69,424	.....	*266,448
Planers, Shapers and Slotters	.....	17,590	.....	*95,741
Bending and Power Presses	.....	15,806	.....	*207,794
Gear Cutters	.....	6,174	.....	*22,446
Milling Machines	.....	25,255	.....	*107,053
Sawing Machines	.....	2,930	.....	*20,590
Thread Cutting and Screw Machines	.....	17,668	.....	*71,649
Punching and Shearing Machines	.....	12,610	.....	*75,884
Power Hammers	.....	13,188	.....	*52,827
Rolling Machines	.....	16,270	.....	*23,919
Wire-drawing Machines	.....	2,248	.....	*4,134
Polishing and Burnishing Machines	.....	83	.....	*8,794
Sharpening and Grinding Machines	82,183	83,104	2,515,999	763,411
Other Metal Working Machinery and Parts of	923,953	308,383	25,191,658	6,138,679
Textile Machinery	1,387,118	1,520,512	22,468,133	16,083,407
Sewing Machines	631,809	504,674	10,796,308	5,036,771
Shoe Machinery	88,994	79,748	2,691,430	915,494
Flour-Mill and Gristmill Machinery	247,709	97,703	2,180,176	956,338
Sugar-Mill Machinery	925,866	184,276	27,511,937	3,897,737
Paper- and Pulp-Mill Machinery	157,993	.....	3,453,677	†1,376,074
Sawmill Machinery	90,130	33,569	1,337,513	546,869
Other Woodworking Machinery	193,488	88,996	3,725,058	982,708
Refrigerating and Ice-Making Machinery	71,850	177,877	3,288,132	1,700,700
Air Compressors	205,139	285,430	5,382,697	1,749,559
Typewriters	757,192	1,136,860	18,143,716	9,383,558
Power Laundry Machinery	79,366	68,030	1,082,832	509,912
Typesetting Machines	263,911	432,996	4,369,877	3,046,561
Printing Presses	626,133	266,703	10,026,628	4,467,217
Agricultural Machinery and Implements	3,275,126	1,603,574	48,081,651	17,236,251
All Other Machinery and Parts	11,127,159	8,065,242	183,510,313	85,668,094
Total	$31,287,655	$19,415,994	$561,200,355	$222,427,107

*—January 1, 1922, to May 31, 1922.
†—July 1 to December 31, 1921

LIBRARY
WEST VIRGINIA UNIVERSITY

As is shown by the accompanying table of exports by countries, Japan continued in May its first position as the leading foreign market for American iron and steel. Of the 34,619 tons of black steel sheets exported in May, the largest single item of export, that country took 28,211 tons, or 81 per cent, while of the 26,544 tons

Exports of Some of the Leading Steel Products to Principal Countries of Consumption

	May, 1922	11 Months Ending May, 1922
Plates		
China	6,083	8,003
Canada	5,427	53,683
Black Steel Sheets		
Japan	28,211	230,690
Canada	3,770	26,475
Rails		
Japan	11,612	82,323
Canada	3,425	27,187
Wire		
Japan	3,353	30,747
Argentina	2,741	7,199
Australia	1,811	4,867
Canada	1,428	12,602
Wire Rods		
Japan	2,416	.....
Canada	1,522	.....
China	316	.....
Hoops and Bands		
Canada	1,035	.....
Tin Plate		
Japan	2,301	.....
Canada	1,836	.....
Argentina	489	.....
Chile	359	.....
Cuba	330	.....
Brazil	299	.....
Structural—Not Fabricated		
Japan	8,097	.....
Canada	6,455	.....
Iron and Steel Bars		
Japan	13,245	.....
Canada	5,017	.....
Skelp		
Canada	9,024	.....
Scotland	2,224	.....
Scrap		
Japan	5,892	.....
China	4,225	.....
Italy	1,505	.....
Hongkong	979	.....
Pig Iron		
Canada	2,110	.....
England	1,205	.....
Ingots, Blooms, Etc.		
Canada	1,816	.....

of iron and steel bars Japan took 13,245 tons or practically 50 per cent. It also led in six other items, as is shown in the table.

Products which showed sharp gains in exports in May over April include black steel sheets, steel rails, plain structural shapes, boiler tubes and welded pipe and plain wire.

Exports, January, 1920, to May, 1922, Inclusive

	Gross Tons		
	All Iron and Steel	Pig Iron	Semi-finished Material
Calendar year 1919...	4,239,837	309,682	258,907
January, 1920	333,601	18,468	19,937
February	308,185	15,739	22,693
March	417,216	22,740	30,444
April	395,120	14,608	19,032
May	420,359	13,032	16,370
June	402,707	17,075	29,811
Fiscal year 1920.....	4,212,732	248,126	288,766
July	458,866	29,647	17,243
August	431,484	22,645	20,920
September	409,200	22,724	18,113
October	452,015	17,296	11,853
November	434,297	13,929	7,042
December	498,765	10,055	3,415
Calendar year 1920...	4,961,851	217,958	216,873
January, 1921	547,394	3,710	315
February	393,328	1,307	92
March	230,635	2,320	1,023
April	162,592	1,234	678
May	142,551	2,541	749
June	119,081	1,689	1,106
Fiscal year 1921.....	4,168,619	129,541	82,549
July	86,523	2,744	363
August	75,827	2,424	2,447
September	95,169	3,078	1,318
October	106,582	2,830	153
November	122,290	1,299	1,869
December	134,415	2,550	250
Calendar year 1921...	2,213,042	28,305	10,363
January, 1922	160,920	1,043	4,683
February	133,975	1,430	6,627
March	208,843	2,724	10,002
April	198,830	2,750	9,376
May	230,062	3,897	13,091
Eleven months	1,498,993	26,344	51,423

Next to scrap, ferromanganese constituted the biggest single item of imports in May, amounting to 5213 tons, which appears to be due to the impending duty that has been placed on this product in the new tariff bill. Scrap imports totaled 7292 tons, while pig iron imports, ranking third, amounted to 4476 tons.

Tests of Bricks Made from Slag

For utilization of blast furnace slag in making slag bricks, the following scheme is proposed by E. P. Gangewere, Lehigh University, who has patented the idea:

1. Discharge slag directly from furnace into cars filled to depth of several feet with water.
2. Place disintegrated slag into centrifugal drier.
3. Run product through pulverizer, crushing slag to such a degree that 75 per cent will pass through a 100-mesh sieve.
4. Mix one part of cement to twelve parts of powdered slag, adding small amount of water.
5. Mold the resulting mixture in presses to bricks of standard size.

The bricks thus produced from slag of Bethlehem Steel Co. furnaces at Bethlehem, Pa., have been tested at the Fritz Engineering Laboratory at Lehigh University by Mr. Gangewere, who reports the following results:

Transverse tests, with supports ⅝ in. from each end; width, 2 5/16 in.; depth, 4 in.; span, 7 in.; average breaking load, 7000 lb.

Compression test with bricks set on edge after being broken in half. The following area was subjected to compression: length, 4 3/16 in.; breadth, 2 5/16 in.; average breaking load, 80,000 lb., or ultimate strength of 8500 lb. per sq. in.

Absorption test. In a period of eleven days the bricks absorbed 7.15 per cent of their weight in moisture.

In subjecting the bricks to a double-shearing test they failed at a unit load of 1650 lb. per sq. in.

The results are taken to show that bricks produced from blast furnace slag have a strength far above the average produced from shale or clay. The texture of the bricks is uniform, and an even, smooth surface results from this method of manufacture.

The cost of producing this product is claimed to be far less than that involved in making bricks from clay or shale, and the whole process can be operated in conjunction with any blast furnaces.

The specifications of the American Society for Testing Materials for vitrified building brick call for 5000 lb., the average minimum compressive strength, tested on edge and an absorption limit of 5 per cent or less after five hours' boiling, or 5 to 12 per cent in the case of hard brick.

The United States Government investigated the cost of making common clay brick on the Hudson River in 1920, and found it to be $13.19 per thousand, plus $3.93 per thousand for barge transportation to New York, making the delivered cost $17.12 per thousand. Such brick is now selling at $18 to $24 retail, while a good grade of vitrified brick will bring around $40.

In an endeavor to direct the attention of foreign-born employees to the citizenship classes conducted by public schools, the Bureau of Naturalization of the United States Department of Labor is offering employers for display in the shop any number of posters calling attention to the free government textbooks and advantages of enrollment. It is also asking data on the number of employees various companies have assisted in obtaining naturalization, the success of public school classes, classes in the plant, etc. Suggestions are called for in the belief that a compilation of such information will be helpful to all industry.

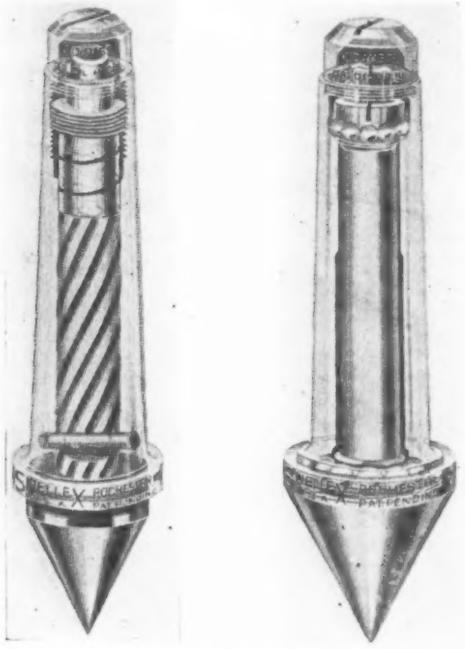
For using anthracite culm as a boiler fuel, the Susquehanna Collieries Co. at Lykens, Pa., has increased its equipment of pulverizers by the purchase of two 42-in. Fuller-Lehigh mills. The steam plant includes six 600-hp. Edgemoor boilers.

Centers for Lathes and Grinders

An anti-expansion center and an anti-friction center, as shown in the accompanying illustrations, have been placed on the market by the Snellex Mfg. Co., Rochester.

The anti-expansion center is for lathe headstocks and releases automatically the pressure caused by expansion of the work. It is said to save adjusting of expansion at the tailstock, ragged or burnt center-points, heavy side-wear on the headstock bearing, buckling of small diameter work, or slippage of drive belts.

The center releases the force of expansion by withdrawing in the sleeve as far as the work expands, the movement being limited by a stop pin. A spring device, which is of a solid piece of tool steel and has no hole,



The Anti-Expansion Center Is Shown at the Left, and the Anti-Friction Center at the Right

is located at the end of the center and is adjustable to equalize the cutting pressure. An oil-grooved stem is provided and is accurately fitted in the sleeve. Lubrication is through an oil hole in the adjusting screw. All parts are hardened and are fitted to assure lasting accuracy in production to within one ten-thousandth of an inch.

The anti-friction center is for lathes and grinders and turns with the work, on ball bearings. It is intended to eliminate friction on the center point, and to save lubrication of center holes, worn centers and spoiled work therefrom, re-grinding centers, and chattering of work. The ball bearings will carry the load without chatter. The ball races are formed in one piece with the center parts and their angular position gives the balls a spinning, as well as a rolling motion, which keeps the balls round and uniform in size. The cone is keyseated with the stem and is adjustable to compensate for wear of the ball bearings, the adjusting nut being split on one side. The center holds enough oil to lubricate the bearings for a month and is sealed by an oil cap and a dust guard to prevent entering of chips or dirt. All parts are hardened and precisely finished to permit of accuracy of production to within one ten-thousandth of an inch.

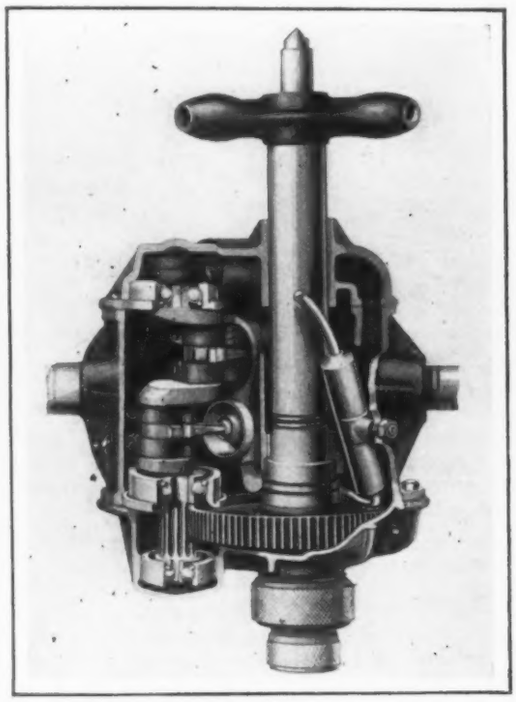
Bessemer Plant Resumes

Current operating schedules of the Republic Iron & Steel Co. provided for the resumption July 5 of its Bessemer department at Youngstown, following a protracted suspension. Except for a 90-day operating period in 1921, this department of the Republic company's plant has been idle since late in 1920. Its operation follows closely the lighting of a third blast furnace in the company's Haselton group. The Bessemer plant was scheduled for operation in April, but the coal miners' strike prevented its resumption at that time. Meanwhile the company has been purchasing its Bessemer steel requirements in the open market.

Air Drill with New Features

The Little Giant air drill of the Chicago Pneumatic Tool Co., New York, will be equipped with a new feature known as the Oil Vent which is designed to prevent oil leakage and to obviate the necessity of frequent oiling of the machine. Another feature that will be incorporated is the Invincible one-piece interchangeable toggle, which, among other advantages, provides a large opening at the top and bottom of the toggle bearing, permitting lubricant to come in direct contact with the crank pins.

The arrangement of the Oil Vent may be seen in the illustration. It is applicable to most sizes and types of the Little Giant drills, it being provided as regular equipment on new drills, but being also attachable to machines now in use. It contains a sliding plunger intended automatically to prevent oil leakage regardless of the operating position of the drill. The new



Pneumatic Drill with Oil Vent Feature to Prevent Oil Leakage and Obviate Frequent Oiling

device is claimed to effect considerable saving of time, labor and lubricant.

In the one-piece interchangeable toggle the toggle bearing and connecting rod are integral and are held in place in pairs by means of hinged split collars. The toggle mechanism may be assembled or disassembled without dismantling the drill. A 30 per cent reduction in weight is claimed for the new arrangement.

Production of the Truscon Steel Co., Youngstown, Ohio, is running close to normal, and business is well sustained, according to a statement by President Julius Kahn. "We never had a larger volume of business in the history of the company than at the present time," he states. "We are getting foreign orders as well as a variety of domestic business. Our steel supplies are satisfactory. Unless interrupted by coal shortage or a rail strike, business is likely to be maintained at this rate for some time." The company is an important fabricating interest manufacturing a variety of steel products entering into fireproof building, road and bridge construction.

Industrial Course at Pennsylvania State College

The seventh annual summer session in industrial organization and administration will be held at the Pennsylvania State College from Aug. 28 to Sept. 9 under the immediate direction of Prof. Edward J. Kunze, assisted by Prof. J. O. Keller and P. P. Henshall of the department of industrial engineering.

The course is an intensive one, designed to meet the needs of manufacturers, superintendents, personnel directors, accountants, production managers and all others who pilot the affairs of industry.

Its purpose is to assist men in the development of their jobs, to broaden their horizon of the possibilities of the science of management and to illustrate to them by practical examples the most effective methods of modern organizations. It is not a theoretical resume of a batch of reading material but rather a careful consideration of the theory in its application.

The work is divided into discussions on industrial organization, manufacturing methods, employment, industrial relations, factory planning, material and production control, scheduling and dispatching, purchasing, cost accounting, and kindred subjects. The greater portion of the time is devoted to practical installation methods, using the equipment of the five shops and the other facilities of the department that have been especially designed to handle this type of work.

Besides the discussions and laboratory applications, provision has been made for group conferences, a feature which last year brought forth so much favorable comment. The benefit to be derived from intimate contact with others whose problems are mutual and the valuable acquaintanceships formed make this group conference feature a very valuable one.

The different lines of manufacture followed by those who have attended former sessions have been varied. It has been the custom for many companies to send one or more of their executive staff to attend the course and report back not only along the specific line of the attending executive but also along such other lines as may indicate or provide solutions to needs of the company.

Bulletins describing the course may be obtained by addressing Prof. Edward J. Kunze, State College, Pa.

John Fritz Medal Awarded Marconi

The John Fritz Medal, one of the highest distinctions bestowed by the engineering profession in this country, has been awarded for 1922 to Senator Guglielmo Marconi, the inventor of wireless telegraphy.

The medal will be formally presented to Senator Marconi at a gathering of engineers to be held in the Engineering Societies Building, New York, Thursday evening, July 6.

Prof. C. A. Adams, Harvard University and chairman of the John Fritz Medal board of award, has appointed the following committee to arrange for the presentation ceremonies: Benjamin B. Thayer, New York, chairman; George S. Webster, Philadelphia; Walter M. McFarland, New York; William McClellan, Philadelphia.

Simplification in Manufactures

In connection with the investigation by various technical societies into methods calculated to bring about simplification in sizes and varieties of commodities, all in accordance with the request of Secretary of Commerce Hoover, the American Engineering Standards Committee has appointed W. A. Durgin, chief of the division of simplified practice of the Department of Commerce, a member of the standards committee, and A. A. Stevenson, former chairman of the standards committee, has been appointed a member of an advisory committee to the division of simplified practice.

The membership of the American Society of Mechanical Engineers has been asked, through the eleven professional divisions of the society, to supply the suggestions desired as to what things may be done in the interest of simplification. Those in charge would, as a matter of fact, like to have anyone who is in a position to do so to give thought to the manufactured articles he is in touch with and consider the possibilities of standardization. Thus he may help in the efforts to reduce waste in industry.

Hadfield Scholarship for Sweden

Sir Robert A. Hadfield has presented to the Metallografiska Institutet, Stockholm, Sweden, a scholarship of £150 per year for two years. This is to be made available to a young scientist for carrying on special research work at the institute, and has been given as "an expression of the debt of gratitude which the world owes to Swedish science." He called particular attention to the contributions of the early Swedish workers in the practical metallurgy of iron.

At the inauguration of the institute, Dr. Carl Benedicks, the director, referred to the lead in modern metallurgy which England had taken, mentioning particularly Henry Clifton Sorby and Sir Robert A. Hadfield, both of Sheffield. He paid touching tribute to the recent great loss which the metallurgical world had sustained in the death of Prof. Henry M. Howe, of New York.

It was the pioneer work of the early Swedish scientists, more than a century ago, which gave the world the first alloy steels. And Bergman, the founder of analytical chemistry, showed the influence of carbon on iron and first defined and differentiated pig iron, wrought iron and steel.

National Safety Council Meeting Aug. 28.

The National Safety Council, 168 North Michigan Avenue, Chicago, will hold its eleventh annual meeting in Detroit Aug. 28 to Sept. 1, inclusive. A special program has been arranged for the metals section, of which J. R. Mulligan, safety inspector of the Bethlehem Steel Co., is chairman. J. A. Northwood, safety engineer, Cambria Steel Co., is vice-chairman, and Walter Hart, safety inspector, Jones & Laughlin Steel Co., is secretary. The program will include reports of officers and committees and several addresses, among which these have been announced: "Outstanding Features of the Safety Movement in Iron and Steel, 1910-1919," by Dr. L. W. Chaney, United States Bureau of Labor Statistics, Washington; "Safety in Electric Furnace Operation," by E. T. Moore, electrical engineer, Halcomb Steel Co., Syracuse, N. Y.; "The Safe Handling of Gas at the Blast Furnace" and "Safety in Crane Repairing," for which no speakers have yet been announced.

There will be a joint meeting of the automotive, drop forge and metals sections on Friday, Sept. 1, at 9 a. m.

All meetings will be held in the new Cass Technical High School, which has just been completed. This building has an auditorium with a seating capacity for 3000 persons. Other rooms are available in the same building for sectional and committee meetings.

Personnel Changes in Standards Committee

The American Engineering Standards Committee, 29 West Thirty-ninth Street, New York, announces the following additions and changes in personnel:

F. J. Schlink, formerly of the development branch of the engineering department of the Western Electric Co., New York, has been appointed assistant secretary of the committee.

The Electrical Manufacturers Council has appointed A. L. Doremus, Crocker-Wheeler Co., New York, as alternate for A. H. Moore, on the main committee of the American Engineering Standards Committee.

The gas group has appointed W. J. Serrill, United Gas Improvement Co., Philadelphia, Pa., as alternate for A. H. Hall on the main committee.

The U. S. Navy Department has designated Commander Harvey Delano, bureau of ordnance, Washington, to represent the Navy Department on the main committee.

The U. S. War Department has appointed Maj. Glen F. Jenks, ordnance department, U. S. A., Washington, as alternate to Brig.-Gen. W. S. Pierce, ordnance department, on the main committee.

WORLD TRADE IN MACHINERY

America's Premier Position Not Menaced by Germany, with Which We Have Exchanged Places Since 1913

The present position of Germany as a competitor in the world's machinery markets has been considerably overrated by many writers, says William Althoff, of the industrial machinery division of the Department of Commerce, in a special survey of the international situation in the forthcoming issue of *Commerce Reports*. Mr. Althoff's conclusions are that America's premier position, which it has captured from Germany since 1913, is not menaced by Germany, whose exports of industrial machinery are now in value well below those of Great Britain, our present closest competitor for first place.

During the years 1910-1913, inclusive, as shown by charts and tables prepared by Mr. Althoff, Germany, the United Kingdom, France, and the United States exported annually a total average of approximately $530,000,000 worth of machinery. Throughout this period Germany held first place, but its proportion fell from 45.1 per cent of the total of these countries in 1910 to 43.6 per cent in 1913. The proportion of the United Kingdom also declined continually during these years, and in 1913 its share was only 28.8 per cent as against 33.1 per cent in 1910. The United States, on the contrary, secured a larger proportion each successive year, rising steadily from 17.1 per cent of the total in 1910 to 20.9 per cent in 1913. In value this represented an increase of almost $57,000,000.

In 1918 and 1919 the United States, as was to be expected, furnished the bulk of the machinery exports, the actual amounts being $282,000,000 and $378,000,000 respectively.

During 1920 Germany was again in the field, the total of the four countries ascending well on toward a billion dollars. Of this the United States supplied nearly one-half (48.9 per cent), the United Kingdom 24.6 per cent, and Germany 20.8 per cent.

The United Kingdom alone of the four countries shows an increase in the value of its exports for 1921, due largely to heavy shipments of textile machinery on orders that had long been unfilled. Machinery exports from the United States fell off considerably during 1921, this being due in a large measure to the reduction in unit prices and to the extraordinary exchange situation that prevailed in the world markets.

It should be particularly noted, however, that our machinery exports last year exceeded in value those for 1918, and were more than twice as great as in 1913.

In other words, during 1921 we exported machinery to the extent of $290,000,000 or 36.2 per cent of the total of the four countries combined, as against $130,000,006 or 20.8 per cent of the 1913 total.

The outstanding feature of the figures presented herewith is that in 1920 and 1921, Germany, in spite of the advantages of favorable exchange rates, low wages Government subsidies, etc., exported only about one-half the proportion it shipped during the pre-war period.

Fundamental conditions at present existing in Germany are such as to seriously impair its position as a competitor in the world machinery markets. To a large extent its low costs have been the result of direct and indirect Government subsidies which the German Government must necessarily abandon. Government control as applied to grain prices has already been abolished, bringing about a general movement for higher wages. Freight rates and raw material prices are rising rapidly, and labor difficulties are becoming increasingly numerous. There is a shortage of both coal and coke. The forced internal loan contemplated by the German Government will undoubtedly be demanded in the near future. The amount is about one billion gold marks, equivalent at present to approximately 70 billion paper marks. This loan will be a heavy burden on industry. The supplementary taxation that must necessarily follow will raise production costs still higher. Furthermore Germany is becoming sold out and the continuation of production will involve increased purchasing of raw materials from outside sources at prices which will be almost beyond the German buyer, although in line with the world markets.

These and other factors make it practically impossible to quote firm prices for long-term commitments. The tendency now is to quote prices subject to increases to cover any enhanced production costs that may occur before the goods are delivered. The cancellation of numerous orders placed in Germany by foreign customers is reported.

All of the above conditions have a further peculiar significance when it is remembered that during recent years German supplies had already found it difficult to deliver machinery in accordance with prices and delivery dates contracted.

Graphite Electrodes for Resistor Elements in Electric Furnaces

To provide electric heat treating furnaces capable of high temperature work, such as necessary in treating manganese steel and other alloys and also in forging and billet heating, the use of solid graphite electrodes as resistors has been developed by F. J. Ryan & Co., Philadelphia. It appears that such construction was begun on the first practical furnace about seven months ago and furnaces of the type are now under construction to meet a demand for temperatures of 2800 to 2900 deg. Fahr.

The designs contemplate the placing of the resistors in any part of the furnace to secure uniform heat treatment, and the company claims that temperature ranges of 1000 to 3600 deg. are feasible. The general arrangement is such that a single resistor can be changed without interfering with the operation of the furnace or necessitating the opening of the center chamber.

F. J. Ryan, president of the company, says that in melting practice it is not expected that furnaces for use on iron alloys will be built with more than 750 lb. holding capacity, but he does not limit the capacity for non-ferrous melting. In heat treating, he says it is possible to build any size or dimension to meet conditions. The principle described is used in melting work and three of a new nose tilt design, automatically controlled, have been built for the alloy plant of the Bario Metal Corporation under a guarantee of temperatures for melting alloys from 3200 to 4000 deg. On present furnaces, it is stated that tungsten and chromium alloys have been melted from the cold condition in 25 to 30 minutes.

New Commodity Divisions

WASHINGTON, July 4.—Beginning with the new fiscal year, the Department of Commerce added three commodity divisions to those already created. They include the chemical division, headed by C. R. Delong of Ohio; the banking and investment division, headed by G. M. Jones of New York and the specialties division, headed by Edward Morse of Boston. This makes seventeen commodity divisions now installed within the department. It also has added a mineral section, beginning July 1, to the iron and steel division.

The Personnel Research Federation has established a monthly journal, published by Williams & Wilkins Co., Baltimore. The first number, dated May, contains an article by President James R. Angell of Yale University, on the reasons for personnel research, by Alfred D. Flinn, secretary of the Engineering Foundation and of the Personnel Research Federation, on the development of the federation, and by C. S. Yoakum, of the Carnegie Institute of Technology, on experiments in vocational guidance.

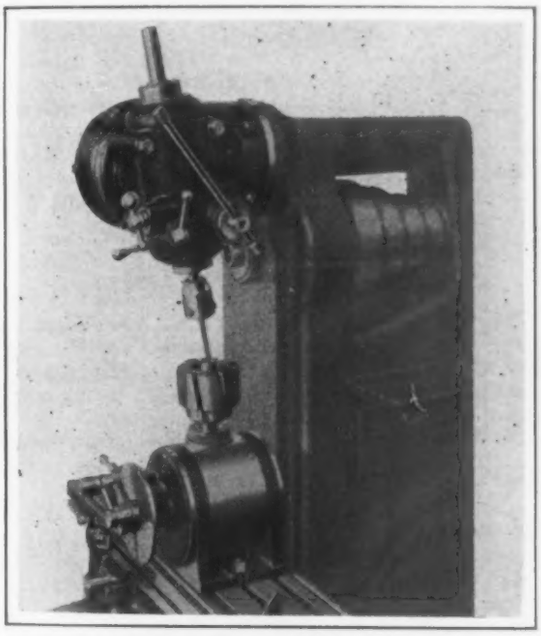
The Central Ohio Manufacturers Association, composed of manufacturers located in 12 Ohio counties, at its recent annual meeting elected T. R. Barnes, Barnes Mfg. Co., Mansfield, president. Other new officers are: first vice president, R. O. Parrott, Bucyrus; second vice president, F. B. McMillan, Mt. Gilead; third vice president, E. B. Phillips, Kenton; fourth vice president, F. E. Myers, Ashland; secretary-treasurer, W. P. Leonard, Mansfield.

Milling and Drilling Attachment

A universal milling and drilling attachment for the Rockford millers has been placed on the market by the Rockford Milling Machine Co., Rockford, Ill. It is a combination of two tools for use where there is considerable work to be done, which requires angular milling of surfaces or drilling at different angles.

The attachment is clamped by four bolts to the face of the machine column as shown in the accompanying illustration. There are two graduated bases at right angles to each other, both of which can be swiveled through 360 deg. This construction makes the spindle completely universal.

The drive is obtained by means of a geared connection from the back of the main spindle through a driving sleeve substituted in place of the overhanging arm. The same driving sleeve and intermediate gear as used with the company's standard vertical milling and slotting attachments is used. From the sleeve the drive is



Universal Milling and Drilling Attachment in Use Reaming a Taper Hole in a Cutter Head

through bevel gears driving a set of hardened steel bevel gears solidly mounted on a shaft and which drive a set of hardened steel bevel gears that drive the attachment spindle. This arrangement leaves the main spindle of the machine free, to be used as desired. On many jobs it is possible to do milling with a cutter inserted in the main spindle of the machine and angular milling or drilling at the same time.

A rack and worm feed is provided, which is a convenient feature for boring operations to close limits. This feed is obtained by loosening a thumb screw and moving the drill handle sleeve in, which throws it into clutch with the worm and rack. The rack and worm feed ratio is 48 to 1, that is, when using the worm feed, the feed is 48 times as fine as the hand feed.

There are 16 spindle speeds obtainable, ranging from 21 to 414 r.p.m., and drills 3/16 to 1¼ in. can be used advantageously. The spindle sleeve is graduated in inches and has an adjustment of 5 in., which increases the vertical range. On the inside of the spindle sleeve a take-up nut or the lower spindle bearing is conveniently located. Adjustment of the upper spindle bearing is independent of the lower and is made by means of an accessible nut.

The main spindle is of crucible steel and runs in phosphor bronze bearings, fitted with felts for retaining oil. The spindle hole is bored to No. 9 B & S taper. The net weight of the attachment is approximately 330 lb.

The Sumter Radio Mfg. Co. has leased suitable space and will manufacture radio parts aimed for quality rather than quantity.

New Potts Warehouse in Philadelphia

Horace T. Potts & Co., with a record of 107 years in the iron and steel business established in 1815 by the great-grandfather of the present active partners, are breaking ground on plot of about 10 acres on East Erie Avenue, Philadelphia, with a frontage on the Pennsylvania Railroad of 1042 ft. for new warehouses, office building, garage, machine shop, power house and watchman's residence. The total expenditure will be in excess of $500,000.

The office building will contain some 5400 sq. ft. for general office work and storage of records, and in addition will afford space for employees' rest rooms, locker rooms, lavatories, shower baths, restaurant and kitchen.

One warehouse 120 x 192 ft. will be equipped for dry and warm storage of cold finished steels, bands, hoops, sheets, wire, fencing, tool and alloy steels and light materials injured by dampness and rust. Dry air under forced pressure will be supplied to this building. Another building 75 x 369 ft. will be equipped to handle heavy and long sections up to 45-ft. lengths. Electric cranes, three of 7½ tons capacity and one of 3 tons capacity, as well as electrically driven saws, shears and punches, automatic scales, interplant railroad and trucking and up-to-date racks and storage facilities will be installed. The railroad siding will accommodate 10 cars at one time with unloading facilities either into truck or into warehouse.

The development of the autotruck and the call for prompt deliveries of material to distant points have made necessary the maintenance of a fleet of trucks and these and the automobile equipment of the sales department will be kept in repair in the company's own machine shop.

The Potts company has been a large importer of Swedish iron in the form of pig iron, wire rods in coils for making chain and rivets, bars, blooms for rolling into boiler tubes, melting bars for the manufacture of crucible steels and Swedish tool steels and anvils. The organization has also at times done an export business in iron and steel, largely with Australia, South America and the Orient.

At home it has developed a trade in tool and alloy steels and of other grades of steel and iron for various uses sold under its own special names and trade mark.

Employees can invest their savings in the business, receiving a guaranteed return of 7 per cent annually and with provision for withdrawal in full or part at any time. Group life insurance, beginning at $1,000 after six months' employment and running up by degrees to $3,000 after fifteen years, is carried at the expense of the firm. The purchase and owning of homes has been encouraged and aided.

By-Product Coke Plant for Mexico

The American Smelting & Refining Co. plans to build a by-product coke plant at Coahuila, in the district of Sabinas, Mexico, according to an announcement by William Loeb, Jr., vice-president of the company. Mr. Loeb was in Mexico in April conferring with President Obregon and other officials regarding the project. Construction work will not be begun until official authorization has been received from the Mexican Government and an agreement reached regarding taxation. The plant will cost about $7,000,000 and will include a model village with workmen's homes.

To discuss management methods and results in different localities, the management division of the American Society of Mechanical Engineers, in co-operation with the Society of Industrial Engineers and the Taylor Society, will provide for a series of meetings throughout the country in the week of Oct. 16 to 21. This special activity will be known as management week.

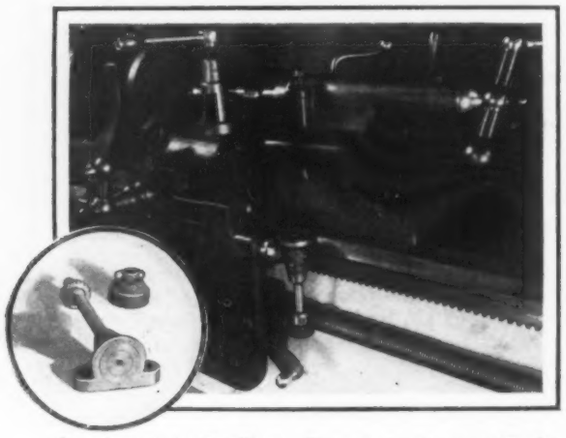
While the negotiations, whereby the General Refractories Co. will absorb several smaller companies, making fire clay and silica brick have not yet been concluded, they are progressing and an official announcement is expected in about a week or so.

Threading Dial for Lathes

The dial device shown in the illustrations is being placed on the market by James M. Colven, 20 Wolffe Street, Yonkers, N. Y., and is intended to facilitate thread cutting on engine lathes. It is known as the E-Z and is said to be easily installed on the carriage of any make of lathe by simply drilling and tapping two small holes.

The device is made up of a cast-iron bracket, a brass sleeve, a brass dial, a steel shaft and a brass worm gear suitable to the lead screw with which it is to operate. It serves for internal or external, odd or even right or left hand threads, and threads of any diameter or length. Threads can be cut close up to the shoulder without difficulty. In operating the device the operator has only to close the nut on the lead screw at the proper time, which the dial indicates, and open it when the tool has traveled the distance required, the lathe running continuously.

When cutting an even number of threads per inch the half nut can be engaged at any line on the dial, and



Attachment to Facilitate Thread Cutting on Engine Lathes. It permits continuous operation

when cutting odd threads the nut is engaged at any of the numbered lines on the dial. For half threads the nut is engaged at every half revolution of the dial.

With this device the lathe may be run continuously until the thread is finished, it eliminating the necessity of stopping and reversing the machine at the completion of each cut through the thread. Among the advantages claimed are that a backing or reversing belt is unnecessary and starting the lathe and not stopping it until the thread is finished, saves time and reduces the cost of cutting threads.

Saving Eyes by Goggles

ST. LOUIS, July 3.—How in 20 or 25 cases a year it is found that the vision of one or both eyes has been saved by the use of goggles, thereby saving a Pittsburgh steel company employing about 8000 men about $50,000 or $60,000 in compensation a year was related in a paper read last week by Dr. V. E. Van Kirk of Pittsburgh before the section on Ophthalmology of the American Medical Association. The subject was "Industrial Ophthalmology."

The paper represented a survey of 25,000 cases in a mill consisting of furnaces, open-hearth and Bessemer, rolling mills and the various co-ordinating departments. The medical and "safety first" departments were organized in the mill about 12 years ago. The paper says:

"The various types of goggles to be used in a mill should be inspected by the ophthalmologist with care, as many of them are not fit to be worn. The frames can be had in different weights for various kinds of work. The thickness of the glass varies also, but must always be a plain glass. The goggles must be in various sizes, so that all the men can be comfortably fitted.

"Goggles are worn by men in chipping or grinding, for example, where there is increased danger of eye injury. Plate glass shields are used on punches and like machines to protect the worker from chips of steel. Masks are worn by men pouring babbitt metal. Special goggles of various kinds are worn by men using the oxy-acetylene torch or electric arc in welding, furnace workers and others exposed to intense light.

"The employees are now on an honor system; a man who sees a fellow employee breaking one of the rules of safety first is justified in reporting him to the foreman. The penalty for failure to wear goggles when so ordered is rarely necessary now; the men realize the value of this protection."

Dr. George H. Cross, Chester, Pa., who led the discussion of the paper, said that of 13,008 accidents among employees of a large corporation, 5843 were injuries to eyes, as were 2000 of 3893 in another corporation. A factor in the large percentage of eye cases recorded was that the employees have been successfully educated to come to the ophthalmologist for even dust in the eyes, 536 reporting last year for the removal of a foreign body from the eye when there was none in it. The latter was regarded as an encouraging sign.

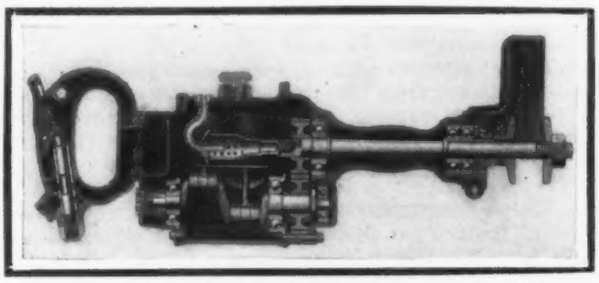
The principal objective for education, it was thought, should be the men in charge of industry. More men will wear goggles and adopt other safety measures if there are plant rules and factory owners must be shown that accident prevention will save money, it was said, for measures for avoiding and caring for injuries will be adopted in proportion as the leaders of industry are taught that they are measures of economy.

Improves Portable Air Tool

The Chicago Pneumatic Tool Co., New York, has devised what is called an oil separator for its Little Giant air grinders, which, it is claimed, permits continuous operation of the machine for 48 hr. or longer without replenishing the supply of lubricant.

The oil separator consists of a hollow perforated cylindrical steel shell attached at one end to the grinder spindle as shown in the sectional view herewith. At the other end it encircles and revolves around the vent tube. As the oil-laden air enters the holes in the separator, the centrifugal action separates the oil from the air, permitting the air to escape, oil-free, through the vent tube and preventing oil leakage.

The new feature is applicable to the larger sizes of Little Giant grinders and can be attached to such



Continuous Operation for 48 Hr. Without Replenishing Lubricant Is the Feature

grinders now in use. Considerable saving in lubricating expense is claimed because oiling is necessary but once a week instead of daily.

A new wire brush for removing rust and old paint is also an added feature of the company's air grinders. It consists of three units: a ⅛ in. dished back plate, a ⅛ in. front plate having a series of slots through which the wires project, and a wire brush made up of 30 renewable units of heat-treated crucible steel.

Suspension of coal mining in Pennsylvania has cost that state $200,000,000 to date, according to the State Commissioner of Labor. Loss of wages of 326,286 miners is placed at $94,420,755, of which $41,979,600 is in the anthracite fields and $52,441,155 in the bituminous fields. Loss to the operators is estimated to be $52,780,000 in the anthracite fields and a similar amount in the bituminous fields.

CONTENTS

July 6, 1922

Physical Tests on High-Speed Steels 1

Transverse and Tensile Tests of Two Grades Compared—Effect of These Properties on the Service of the Tool

Trade Status of Some Minor Steel Products 7

Facts and Figures Collected by Tariff Commission Relating to Production and Markets, Also Export and Import Trade

American Society for Testing Materials 13

Annual Convention Discusses Steel Castings and Cast Iron, Sulphur in Steel, Impact Testing and Fatigue of Metals

Iron and Steel Exports Gain Heavily 24

Highest Exports Since March, 1921—Rails, Black Sheets, Structural Shapes, Pipe and Wire Share in Increase—Imports Higher

Pig Iron Production in June 36

Gain of 4292 Tons Per Day Over May, More Largely Among Merchant Furnaces Than Steel Company Stacks

Large Automotive Merger 6
Trade Commission Merger Questionnaire 6
Clay Pipe as Substitute for Cast Iron 6
Cutting Cruiser Into Scrap 9
Federal Trade Commission Personnel 9
Mechanical Puddling 9
French Tariff Changes Urged 10
Puddling Wages Advanced 10
Metal Schedule Completed 11
New Pacific Coast Company 11
German Price Trend Upward 12
Coal Situation 19, 37, 58
Mineral Section of Commerce Department 19
Reduced Railroad Rates 20
Pittsburgh Basing Case at Chattanooga 21
Surface Condenser with Separate Cooler 22
Adoption of Uniform Cost Accounting 22
Plain and Back Geared Tapping Chucks 23
Aluminum Plants Leased 23
Tests of Slag Brick 25
Centers for Lathes and Grinders 26
Air Drill with New Features 26
Summer Industrial Management Course 27
Fritz Medal Awarded Marconi 27
Simplification in Manufactures 27
Hadfield Scholarship for Sweden 27
National Safety Council Meeting 27
Changes in Standards Committee 27
World Trade in Machinery 28
Graphite Electrodes for Resistors 28
Milling and Drilling Attachment 29
New Potts Warehouse in Philadelphia 29
By-Products Coke Plant for Mexico 29
Threading Dial for Lathes 30
Saving Eyes by Goggles 30
Improves Portable Air Tube 30
Editorials 32
Unsatisfactory Tariff — International Testing Relations—Business After Two Wars—Impact and Fatigue Testing—Business Memories
Correspondence 35
Standardization of Pulley Sizes
Book Review 35
British Iron and Steel Market 38
American Export Market 38
French Production Active 39
Railroad Equipment Business 45
Fabricated Steel Business 54
Refractories Market 54
Plant Operations 54
Activities of Various Companies 57, 67

Iron and Steel Markets 40
Comparison of Prices 41
Prices Finished Iron and Steel, f.o.b. Pittsburgh 55
Personal Notes 56
Non-Ferrous Metal Market 58
Machinery Markets and News of the Works 59
New York Jobbers' Prices 68

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* PRINTED IN U. S. A. George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York, H. M. Swetland, Pres. Charles G. Phillips, *Vice-Pres.* A. C. Pearson, *Treas.* F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 410 Unity Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building. Detroit: 317 West Fort St. Cincinnati: Mercantile Library Bldg. Buffalo: 881 Ellicott Square. Washington: 816 Fifteenth St., N. W. San Francisco: 320 Market St. London, Eng.: 11 Haymarket, S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

An Unsatisfactory Tariff

The tariff bill as it stands to-day, much amended by the Senate in committee of the whole, may fairly be spoken of as more unsatisfactory than any of its predecessors. It was to be expected that the majority party would frame the schedules on a protective basis and therefore that these would more closely approach the rates of the Payne-Aldrich act than of the existing Underwood tariff. But no consistent policy has been followed in making the new schedules. Moreover, in many instances the existing duties have been so greatly increased that advocates of a moderate tariff, of whom there are many more in the ranks of life-long protectionists than at any time since revenue bills began to be made, have either made open protest or washed their hands of what they fear will be one of the most unpopular of all tariff acts.

It is granted that the public mind in its present state is highly receptive to any and all statements to the effect that special interests are having their way in the making of duties. More easily than ever any increase in existing duties can be put before the people as so much more added to the consumer's burdens for the benefit of domestic producers. War taxes are felt in every quarter; profiteering by retailers in many lines is still notoriously common. The purchasing power of many classes in the community has been cut down by the wage reductions of the past year. These conditions give uncommon weight to criticisms of the pending bill, particularly to criticisms to the effect that in many cases domestic producers have had their way completely in the framing of schedules in which they are interested.

As has been pointed out in these columns from time to time, the efforts of steel manufacturers have been more in the direction of urging that their raw materials be left free of duty or nearly so, than in securing high duties on their finished products. Their ability to export was an important consideration in this connection. Excessive transportation charges and the high labor costs of to-day, even after the reductions of 1921, have made the export position of our steel companies much more difficult than it was in 1913 when the Underwood bill was passed. There was hope that the Senate would reduce the House bill duties on manganese ore, ferromanganese, fluorspar, magnesite and some of the ores entering into the manufacture of special steels. But through the action of the agricultural bloc and various combinations of Senators representing sectional interests, the raw materials duties in the metal schedule have been retained substantially as the House passed them. The manganese ore duty is left at 1 cent per pound of contained manganese, or $11.20 per ton for a 50 per cent ore. The duty on 80 per cent ferromanganese was put at $33.60, instead of $39.42. The fluorspar duty was raised from $5 per ton in the House bill to $5.60. The House duties on crude and dead burned magnesite were finally put at one-half cent and three-fourths cent per pound, just as in the House bill. The House duties on ferrotungsten and ferromolybdenum and their ores were reduced somewhat, but in other duties affecting tool steel prices the changes are immaterial.

Both House and Senate bills continue the Underwood bill's concession to the farmer in free barbed wire, but protection consistency is asserted in respect to cotton ties, the Senate retaining the House bill duty of one-fourth cent per pound, whereas cotton ties are now on the free list.

Changes may yet be made in the metal schedule, as the bill comes up for final consideration in the Senate and later in conference committee, but no important departure need be expected from the policy already approved of imposing on the raw materials of steel manufacture duties that each year will add many millions of dollars to the cost of producing American steel.

That tariff-making under present world conditions and the unparalleled problems, industrial and fiscal, existing at home is a business of high hazard, is being demonstrated almost daily in the popular reactions to the provisions of the pending bill. To add to the uncertainties of domestic industries the form which the pending bill will finally take seems likely to make it short-lived. Radical changes by the next Congress are the well-nigh certain result of its enactment on substantially the present lines.

Large cities are evidently tiring of the expense of wooden stands for reviewing parades. From now on we have reason to expect that municipal officials

and their friends will see and be seen from stands of steel. Portable or sectional structures of fabricated steel can be knocked down and stored against the next celebration. In the long run they undoubtedly will be much cheaper than those of wood, and such a point of economy can be used against any greater first cost, not to mention the relatively little wear and tear of repeated assembly. A New York official has reported that the cost per seat for a stand accommodating 1000 persons is $5.78, and that the cost of cartage and erecting would be 93 cents per seat. Here is a business suggestion that should appeal to the recently organized association of fabricators, who are desirous of extending the applications of structural steel. Here also is an index to the cost of city entertaining. There are no statistics as to the annual number of occasions justifying such seating conveniences, but it is clear that each recipient of the municipal favor represents an outlay of nearly a dollar of the taxpayers' money merely for having his seat put in place. Used a few times a year and lasting, say, ten years, interest and amortization would easily bring the base cost of a seat, without considering the cost of the ticket, to $1.50; but we must have the stands, none the less.

International Testing Relations

While no action was taken by the American Society for Testing Materials, at its annual meeting last week, looking to a revival of the International Association for Testing Materials, there were indications of an undercurrent of sentiment favorable to such a movement. At the international session on cast iron, held by the American Foundrymen's Association in Rochester early in June, there was a strong sentiment for closer international relations on foundry questions, possibly in the shape of an association. Largely because of the Rochester session, the Testing Society's committee on cast iron formally voted a recommendation to the executive committee that international relations be made a subject of negotiation, with special reference to standardized tests for cast iron which might form a more satisfactory basis for comparisons. The Testing Society's retiring president, C. D. Young, in his annual address advocated "strong support for any movement which will again create an international association of testing engineers." Almost simultaneously comes word of the feeling in favor of an international foundrymen's association which was expressed at the recent convention and exhibition of the Institution of British Foundrymen.

There need be no underestimate of the difficulties in the way of reviving the International Association for Testing Materials on the old lines. Some countries represented in the old association are not likely to be participants in a reorganization movement at the start. Russia is one, and there are no indications of any effort to resume relations between German and Austrian engineering societies and those of the Allied countries. What is likely to come first is a movement in which American and British engineers would co-operate. Foundrymen in the two countries might well attempt to reach agreement on the size and shape of test bars that will best represent various classes of castings, and it will probably be found that mechanical testing will furnish sufficient scope for international effort in the foundry trade for a long time to come.

So far as the larger field of the Testing Society is concerned, the effort to revive international relations should be undertaken with a full appreciation of the narrow range of activities open to an international association. The last congress, held in New York ten years ago, showed that even on the matter of the nomenclature of steel the chance of agreement between the metallurgists of the United States and Great Britain was quite remote.

Business After Two Wars

In the Annual Review Number of THE IRON AGE of Jan. 4, 1917, there was given a collection of statistics showing what occurred industrially and commercially after our Civil War, 1861-65, and the Franco-Prussian war of 1870, the object being to furnish the reader with definite facts from which to draw conclusions concerning the years after the World War. Now that nearly four years have elapsed since the termination of hostilities an opportunity is afforded to make some comparisons.

The end of the Civil War was seen upon the investment of Richmond in 1864, although the termination of hostilities did not come until Lee's surrender to Grant at Appomattox Court House, April 9, 1865. It seems fair to take it that Germany surrendered at an earlier stage than did the Southern Confederacy, and if so, 1864 and 1918 are parallel years, so that in essence the summer of 1922 is as far after the World War as the summer of 1868 was after the Civil War. Parallelism or divergence is brought out by comparing years that are 54 years apart.

Following the Civil War there was, in general, a period of great industrial activity and expansion, lasting with short interruptions until the panic in September, 1873. Meanwhile there had occurred "Black Friday," Sept. 24, 1869, caused by the failure of the gold corner attempted by Smith, Gould, Martin & Co. Were there parallelism, then, our Black Friday would come next year and our panic in 1927, five years hence. The computation is made, of course, merely to furnish the necessary perspective.

After the Civil War pig iron and bar iron first suffered a sharp but quite moderate liquidation in price and then held rather steady for years. In 1867, corresponding to last year, there was a moderate decline in pig iron and a slight decline in bar iron, while in 1868 pig iron recovered part way, bar iron having little occasion to recover. Prices continued to recede slightly, in a general way, until the obviously foolish price boom of 1872, which would correspond to 1926, when in a few months prices reached their greatest height since the war, and then started on a long and great decline.

After the Civil War there was no 1919-20 boom in prices. Things were taken more moderately. There can be no doubt that one great difference between conditions then and now is that then men were willing to work hard, and did work hard, while in this recent period men have been unwill-

ing to work hard, but have expected great rewards.

There was what is commonly called an "unfavorable" trade balance during the Civil War and afterward, until 1876. In the active times there was an "unfavorable balance," while in the "hard times" that followed the panic of 1873, the "unfavorable" balance gradually turned into a "favorable" balance. We were selling securities to foreign investors in the period after the Civil War. An "unfavorable" trade balance now would correspond to our permitting our foreign debtors to pay us.

In the panic of 1873 one naturally expects to find information as to what, if anything, was wrong with the eight or nine years of trade activity that followed the Civil War. The panic showed that too much business had been done on paper for the currency system then existing to take care of. We do not have the same danger now on account of our new system. There was much evidence that there had been undue investment in construction work which could not continuously earn its keep, in railroads in particular, and in plants erected to provide railroad materials. The trouble was not that the unit costs had been too great; there was merely a case of endeavoring to develop the country too rapidly. The condition of late has been quite different. Construction costs have been higher than they should be, and if we have an excess of facilities in any quarter, it is the creation of the war period, not of the post-war period.

Impact and Fatigue Testing

Stimulus was given to further work in at least two testing fields by last week's convention of the American Society for Testing Materials. The symposium on impact testing of materials was an impressive review of accomplishment, and the new contributions to the recently published data on the fatigue of metals were of much significance.

While impact testing as applied to steel is older and in more extensive use than fatigue testing, there is a crying need of standardization of machines, methods and test pieces and of more knowledge of the entire subject. The contributions, besides affording valuable data on past progress and the present status of the art, clearly indicated inconsistencies and the need of further study. Impact tests uniformly carried out are necessary in determining properties of metals not possible of detection by other tests. Doubtless the Testing Society, as a result of this year's meeting, will bring order out of the conflicting data.

The remarkable work on the fatigue of steel by Professor Moore and his colleagues at the University of Illinois, in collaboration with the National Research Council and other organizations, was given added distinction by the results published last week. It had been shown previously that among other things cracks and re-entrant angles in the surfaces of steel, due perhaps to machining, are important factors in fatigue failure. It is now fairly well demonstrated that steel possesses a well-defined "endurance limit" below which it can withstand hundreds of millions of reversals of stress and that it possibly can withstand an indefinitely larger number of such reversals. The arresting statement is made that static tension tests of specimens which have withstood 100,000,000 reversals of stress, close to the endurance limit, have given higher values for tensile strength than before the repeated stressing; and the question is raised whether a metal actually can be benefited by repeated stressing below the endurance limit. The serious drawback to this valuable work, however, is the time required to make such tests. The need of a rapid fatigue test was emphasized and is apparent.

Impact and fatigue testing ultimately can be made valuable commercially, but a vast amount of work is yet to be done. Not only is standardization necessary, but a correlation of the results, particularly the impact with static and other properties, is a *sine qua non* of future progress. Metallurgists and testing engineers are co-operating and the desired result is only a question of time.

Business Memories

Judged by what some business men say, their memories are rather short, particularly when they speak of the prices of the commodities they buy and sell. A buyer insists that a certain price is unreasonably high, while a few months later he not only is quite willing to pay it, but is disposed to pay a premium to secure an early delivery. A seller explains that a certain price is his cost, and points out that one cannot possibly expect him to sell at cost, but in a short time he sells eagerly at a still lower figure.

When, in a period of depression, an observer predicts that better times are coming, his prediction is taken lightly, and he may even be called "an irrepressible optimist" or some other opprobrious epithet. When times are "good," one who predicts less good times coming is considered a "calamity howler." In the abstract, the existence of the business cycle is admitted, but there is objection to taking it in the concrete and assigning the present a particular place in the cycle. When, in the progress of the business cycle, prices are going up, we generally find sellers and buyers co-operating to put them up farther. When they are declining there is similar co-operation.

This apparent shortness of memory is a part of human nature. When times are good men do not wish to remember that they are ever bad. When times are bad courage is at a low ebb and men are afraid to act upon the principle that bad times must be followed by good times.

The business cycle has been studied with particular care in recent years, and fond hopes have been entertained that such study will tend to reduce the amplitude of the swings in the cycle. More than study, however, is necessary. There must be a change in the mind, in its acquiring more willingness to be guided by study and in shaking off some of the tendency to be guided by the present; in other words, by what other men are doing.

An example of this shortness, or apparent shortness, of men's memories is present to-day. There is in most lines of trade a degree of activ-

ity greater than that which a year ago would have been entirely satisfactory to the members of those trades. Whether they then were setting their desires too low or are now wanting too much is no point in the argument. The difference in mental attitude is obvious. Thorough consideration should be given, therefore, to those who are now urging that sellers do not press their present price advantage too far, thus drawing the line indicating the cycle so far above the mean as to cause it sooner to descend below the mean.

CORRESPONDENCE

Standardization of Pulley Sizes

To the Editor: In connection with Mr. Hoover's plan of simplification in industry which means the elimination of commercially nonessential types, sizes and styles, I understand that some of the pulley manufacturers have indicated that pulleys might be simplified with advantage. We have had some correspondence with the fabricated production department of the Chamber of Commerce of the United States on this subject and they seem surprised to know that back in 1919 the Electric Power Club adopted specific pulley sizes as the recommended practice for use with each different size and speed of motor. This information is given in the Electric Power Club Handbook.

There was some little misunderstanding due to the fact that our handbook specified belt width instead of pulley width but at the annual meeting of the club at the beginning of this month it was decided to add another column giving the pulley width in addition to the belt width so that there should be no misunderstanding in future.

I am calling this matter to your attention because if the pulley sizes as adopted by the Electric Power Club were universally recognized, it would tend to standardize the different pulleys on the many machines which are sold for belt drive. As it is now, most of these machine manufacturers seem to pick a pulley size out of the air, so to speak, and when the purchaser comes to buy the motor to drive the machine, he has to order a special pulley in order to get the speed he wants out of the driven machine. This is one of the principal reasons why pulley manufacturers think there is no such a thing as standard pulley sizes for motors. This is a subject which I know would interest the readers of your paper and I hope you will help the good work along by giving some publicity to the pulley standardization which has been effected by the Electric Power Club and by pointing out to your readers the advantage of specifying these standard size pulleys when they buy electric motors.

Referring to our handbook, you will find the standard shaft extension sizes and pulley dimensions on pages 107, 108, and 114 for fractional horsepower motors and pages 126, 127, 137, 138, 150, and 151 for large power motors.

You will note that no pulley bore, shaft extension diameter, or key dimensions are given for the 100-hp. motor at 1150 to 1200 r.p.m. or the 75-hp. motor at 850 to 900 r.p.m. These dimensions were agreed upon at the annual meeting June 6, 1922, and are as follows:

Pulley bore and shaft extension diameter, 3⅜ in.

Key dimensions, ¾ in. wide and ½ in. thick.

It was also decided at the same meeting that the dimensions in the new column which is to be added under the heading of "pulley widths" would be obtained as follows:

½ in. shall be added to the present belt widths of 2 to 5 in., inclusive.

¾ in. shall be added to the present belt widths of 6 in. to 7 in., inclusive.

1 in. shall be added to the present belt widths of 10 in. to 14 in., inclusive.

I hope you agree with me on the importance of this subject of pulley standardization and if you publish anything regarding the standardization which has been accomplished by the Electric Power Club, will you please state that the Electric Power Club is an association consisting of the manufacturers which make over 95 per cent of the electric power apparatus and control equipment manufactured in this country. I ask you to make some such statement as this regarding the Electric Power Club because its name is such that most people think it is connected with the National Electric Light Association or with the central stations in the country.

Although the fourteenth edition of the Electric Power Club Handbook is dated March, 1922, it was not actually issued until this month. It is about one-third larger than the preceding edition and all the new material in this edition is dated later than August, 1920. The handbook itself is a standard of measurement, which every buyer of electric power and control apparatus should use. You will note that some of the sections, notably, the industrial control section and the power switchboard and switching equipment section have not only established manufacturing standards but have also compiled specifications for use of the purchaser in buying such equipment.

S. N. CLARKSON,
Executive Secretary.
St. Louis, June 29. ELECTRIC POWER CLUB.

BOOK REVIEWS

Foundrymen's Handbook. — Penton Publishing Co., Cleveland. Pages 309. 6 x 9 in. Price $5.

For some years the *Foundry* has been issuing data sheets of interest to foundrymen and engineers connected with foundry establishments. These sheets have now been collected, divided into proper groups and elaborately indexed. The data themselves have been compiled by competent men and can be regarded correct, so far as "tables" for an advancing industry may be constructed.

The first section embraces general foundry data of a very miscellaneous character, which will doubtless be sub-divided and increased in a subsequent edition. More might well have been given concerning cupola operation. The second section, on computing weights, is quite complete and will be found very useful by the engineering staff connected with active, pushing concerns. The patternmaker is particularly interested in section three, which gives him about thirty pages of data. This should be extended in later editions.

The non-ferrous metals and alloys are ably handled in section four. A profusion of information is gathered here, which will be much appreciated by the brass founder. Some of the foundry specifications in current use follow in section five; and a few tables of miscellaneous character comprise the last section. The index is noteworthy in its completeness and cross reference.

The volume, which is substantially gotten up, is a good fore-runner of the handbook the foundry industry is looking for. It will be well received by the foundry and prove its usefulness time and again. Eventually there should be a well considered grouping of the information presented, with good editorial connecting up, so that instead of merely looking up a table, the foundryman may be briefly informed on the general subject involved, and how the table was constructed. It will then be possible to crowd much more information into a handier volume of thin paper, on the model of Marks' "Mechanical Engineers' Handbook."

Handbook on Controllers for Electric Motors, a 32-page handbook, 4 x 6¾ in., has been issued by the Electric Power Club, 1017 Olive Street, St. Louis, for the information of those using controllers. Words which do not appear in regular dictionaries are herewith explained in simple language, together with instructions for the care and handling of the apparatus.

JUNE PIG IRON OUTPUT

A Gain of 4292 Tons Per Day Over May

Seventeen Furnaces Blown In, Two Out

Despite the coal strike and for the third month in succession, data of the country's pig iron output collected largely by telegraph, show a large gain in June over May. The gain per day in June was 4,292 tons over the rate per day in April. While this is not as large as the gain of 5,339 tons per day in May over April it is larger than the gain of 3,395 tons per day in April over March. A significant feature of the June output is the fact that the merchant iron production showed a larger gain than the steel-making iron output which is the first time that this has occurred in many months.

The production of coke and anthracite pig iron for the 30 days in May amounted to 2,361,028 gross tons or 78,701 tons per day as compared with 2,306,679 tons or 74,409 tons per day in May, a 31-day month. The June increase over May was 54,349 tons. Last year the June output was 1,064,833 tons. Although the June output this year is still less than that of January, 1921, the daily rate is larger, but does not yet equal any record made in 1920.

The total number of furnaces in blast on July 1 was 192 as compared with 175 on June 1, with 162 on May 1 and with only 69 on Aug. 1, 1921, the low point in last year's depression. The capacity of the 192 furnaces in blast on July 1 is estimated at 81,845 tons per day as compared with 77,520 tons per day for the 175 furnaces in blast on June 1. There were 19 furnaces blown in in June and only 2 blown out or banked, a net gain of 17 furnaces. In May the net gain was 13 furnaces with 21 blown in and 8 blown out. These gains compare with 7 in April, 17 in March and 12 in February.

The manganese-iron alloy output of 23,090 tons in June was the largest since April, 1921. Of this total 18,273 tons was ferromanganese and 4,817 tons was spiegeleisen.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from June, 1921, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
June, 1921	29,444	6,050	35,494
July	23,086	4,803	27,889
August	26,037	4,743	30,780
September	27,189	5,661	32,850
October	33,365	6,850	40,215
November	37,960	9,223	47,183
December	41,173	12,023	53,196
January, 1922	42,130	10,933	53,063
February	46,827	11,387	58,214
March	53,547	12,128	65,675
April	56,930	12,140	69,070
May	60,619	13,790	74,409
June	62,534	16,167	78,701

The figures for daily average production, beginning with January, 1916, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1916—Gross Tons

	1916	1917	1918	1919	1920	1921	1922
Jan.	102,746	101,643	77,799	106,525	97,264	77,945	53,063
Feb.	106,456	94,473	82,835	105,006	102,720	69,187	58,214
Mar.	107,667	104,882	103,648	99,685	108,900	51,468	65,675
Apr.	107,592	111,165	109,607	82,607	91,327	39,768	69,070
May	108,422	110,238	111,175	68,002	96,312	39,394	74,409
June	107,053	109,002	110,793	70,495	101,451	35,494	78,701
July	104,017	107,820	110,354	78,340	98,931	27,889	.....
Aug.	103,346	104,772	109,341	88,496	101,529	30,780	.....
Sept.	106,745	104,465	113,942	82,932	104,310	32,850	.....
Oct.	113,189	106,550	112,482	60,115	106,212	40,215	.....
Nov.	110,394	106,859	111,802	79,745	97,830	47,183	.....
Dec.	102,537	92,997	110,762	84,944	87,222	53,196	.....

Among the furnaces blown in during June were the following: Buffalo A furnace and Harriet Y furnace in the Buffalo district; the Robesonia furnace in the Lebanon Valley; No. 2 Isabella furnace of the Carnegie Steel Co., and one Monessen furnace of the Pittsburgh Steel Co. in the Pittsburgh district; No. 1 Newcastle furnace and No. 1 Farrell furnace of the Carnegie Steel Co. in the Shenango Valley; the Norton furnace in Kentucky; the Tod furnace of the Brier Hill Steel Co., No. 3 furnace of the Republic Iron and Steel Co. and the Mary furnace in the Mahoning Valley; No. 4 furnace of the National Tube Co. and one River furnace in northern Ohio; the Milton furnace in southern Ohio; No. 2 South Chicago (old) furnace of the Illinois Steel Co. in Illinois; the Zenith furnace in Minnesota; the Philadelphia furnace of the Sloss-Sheffield Steel & Iron Co. in Alabama and the LaFollette furnace in Tennessee.

Among the furnaces blown out during June were the following: One Shenango furnace in the Shenango Valley and one Johnstown furnace of the Cambria Steel Co. in western Pennsylvania.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for June and the three months preceding:

Pig Iron Production by Districts, Gross Tons

	June (30 days)	May (31 days)	April (30 days)	March (31 days)
New York	148,115	150,141	131,093	124,584
New Jersey	10,725	5,636	4,815	4,199
Lehigh Valley	66,967	66,572	45,714	32,142
Schuylkill Valley	60,925	66,669	58,927	56,893
Lower Susquehanna and Lebanon Valleys	26,501	21,313	17,387	19,948
Pittsburgh district	485,401	479,106	473,584	479,433
Shenango Valley	87,156	79,145	63,940	59,901
Western Penna.	91,494	103,072	106,430	98,502
Maryland, Virginia and Kentucky	54,687	47,862	26,463	24,172
Wheeling district	74,710	66,148	54,450	80,819
Mahoning Valley	240,470	227,053	197,113	207,892
Central and Northern Ohio	236,374	218,547	197,595	226,765
Southern Ohio	30,272	29,311	27,165	35,333
Illinois and Indiana	454,937	459,631	427,427	362,129
Mich., Minn., Mo., Wis. and Colo.	93,723	89,147	67,360	64,665
Alabama	189,101	196,104	171,823	157,441
Tennessee	9,470	1,222	828	1,102
Total	2,361,028	2,306,679	2,072,114	2,035,920

Capacities in Blast July 1

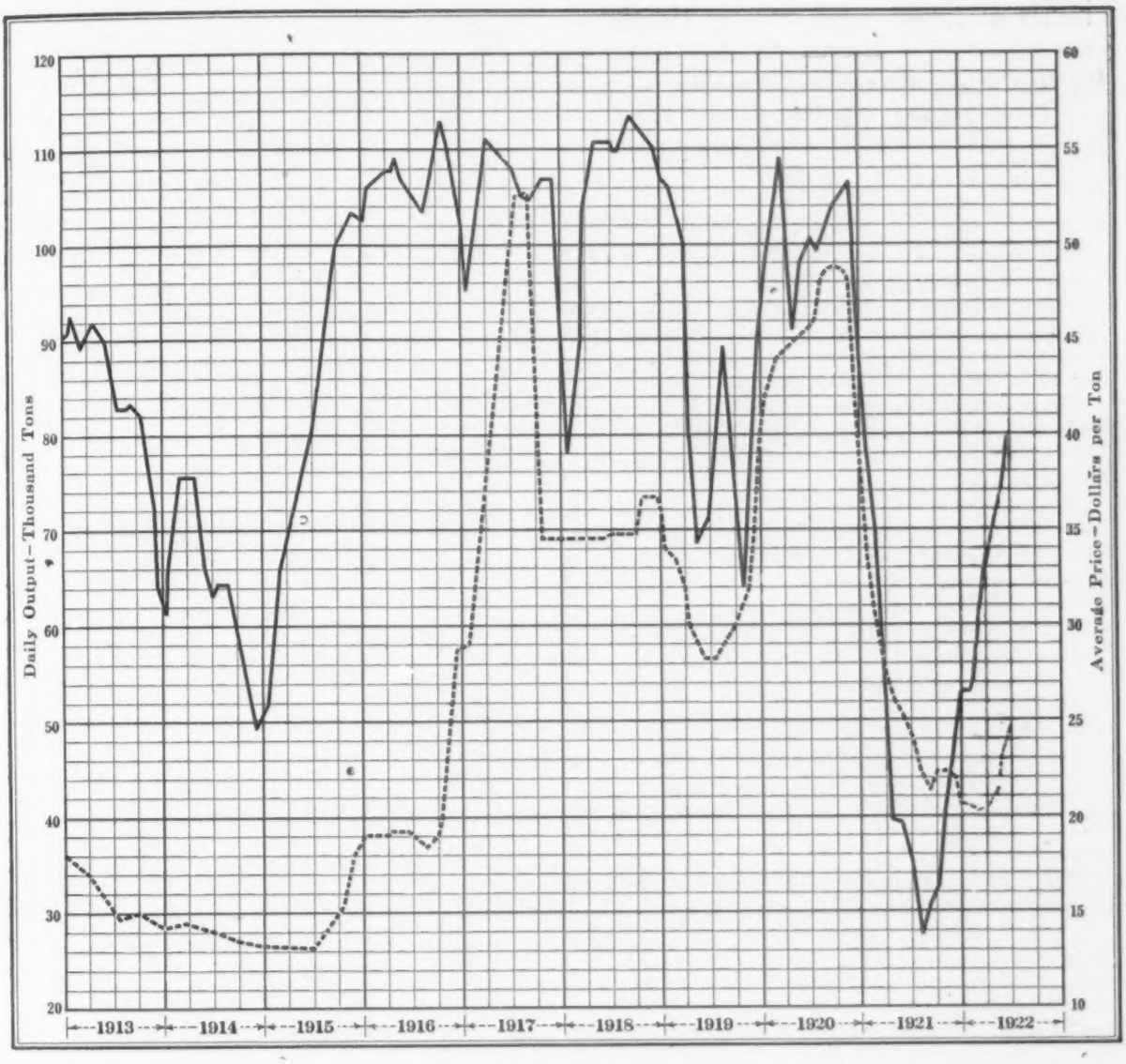
The following table shows the number of furnaces in blast July 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast June 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces	Total Stacks	July 1 — In Blast	July 1 — Capacity per Day	June 1 — In Blast	June 1 — Capacity per Day
New York:					
Buffalo	22	13	5,400	11	4,840
Other New York	4	0	.....	0	.....
New Jersey	4	1	355	1	400
Pennsylvania:					
Lehigh Valley	18	5	2,070	5	2,000
Spiegel	2	1	160	1	170
Schuylkill Valley	15	6	2,030	6	2,150
Lower Susquehanna	10	2	775	2	615
Lebanon Valley	6	1	105	0	.....
Ferro	2	1	70	1	70
Pittsburgh District	55	35	16,300	33	15,215
Ferro and spiegel	4	3	405	3	390
Shenango Valley	19	8	3,300	7	2,825
Western Pennsylvania	26	7	2,870	8	3,325
Maryland	5	3	1,060	3	1,125
Ferro	1	1	130	1	70
Wheeling District	15	5	2,490	5	2,660
Ohio:					
Mahoning Valley	28	18	8,800	15	7,485
Central and Northern	26	17	8,395	15	7,520
Southern	16	3	1,020	2	945
Illinois and Indiana	42	28	15,350	27	15,200
Mich., Wis. and Minn.	11	6	2,300	4	1,660
Colorado and Missouri	6	3	1,170	3	1,215
The South:					
Virginia	16	0	.....	0	.....
Kentucky	7	2	600	1	300
Alabama	41	20	6,340	19	7,040
Tenn., Ga. and Texas	16	3	350	2	300
Total	417	192	81,845	175	77,520

Diagram of Pig Iron Production and Prices

The fluctuations in pig iron production from 1913 to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnaces in Chicago, and No. 2X at Philadelphia. They are based on the weekly quotations of THE IRON AGE.



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1918—Gross Tons

	1918	1919	1920	1921	1922
Jan.	2,411,768	3,302,260	3,015,181	2,416,292	1,644,951
Feb.	2,319,299	2,940,168	2,978,879	1,937,257	1,629,991
Mar.	3,213,091	3,090,243	3,375,907	1,595,522	2,035,920
Apr.	3,288,211	2,478,218	2,739,797	1,193,041	2,072,114
May	3,446,412	2,108,056	2,985,682	1,221,221	2,306,679
June	3,323,791	2,114,863	3,043,540	1,064,833	2,361,028
½ year.	18,002,572	16,033,808	18,138,986	9,428,166	12,050,683
July	3,420,988	2,428,541	3,067,043	864,555	.....
Aug.	3,389,585	2,743,388	3,147,402	954,193	.....
Sept.	3,418,270	2,487,965	3,129,323	985,529	.....
Oct.	3,486,941	1,863,558	3,292,597	1,246,676	.....
Nov.	3,354,074	2,392,350	2,934,908	1,415,481	.....
Dec.	3,433,617	2,633,268	2,703,855	1,649,086	.....
Ttl. yr.	*38,506,047	30,582,878	36,414,114	16,543,686	.....

*These totals do not include charcoal pig iron. The 1921 production of this iron was 94,730 tons.

Production of Steel Companies—Gross Tons

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies, as well as from merchant furnaces producing ferromanganese and spiegeleisen, show the following totals of steel making iron, month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total Production			Spiegeleisen and Ferromanganese		
	1920	1921	1922	1920	1921	1922
Jan.	2,232,455	1,932,159	1,306,045	23,957	22,228	6,874
Feb.	2,181,679	1,625,695	1,311,170	28,038	29,013	8,540
Mar.	2,480,668	1,323,443	1,629,982	35,275	41,294	13,695
Apr.	1,968,542	1,015,621	1,707,902	27,828	24,310	19,209
May	2,128,720	1,024,678	1,879,180	33,407	9,232	20,334
June	2,209,770	883,312	1,876,033	34,751	4,536	23,090
July	2,230,567	715,664	.....	36,789	5,524	.....
Aug.	2,254,943	807,144	.....	36,985	3,878	.....
Sept.	2,247,250	815,692	.....	39,546	3,289	.....
Oct.	2,393,644	1,034,312	.....	34,786	3,902	.....
Nov.	2,150,075	1,138,789	.....	26,944	3,525	.....
Dec.	2,047,167	1,276,381	.....	28,023	3,953	.....

Coal Conference in Deadlock

WASHINGTON, July 3.—Adjournment of the bituminous coal conference until next Monday has left for speculation only the result of efforts made, through the offices of the Government, to settle the strike. To all outward signs the operators and miners are deadlocked, the former refusing to accept the suggestion of the miners that a settlement be based upon National agreements, while the miners appear to be strongly opposed to the operators' suggestion that it be based upon district agreements. This has led to reports that one side might find a convenient way out of yielding to the other by accepting a plan proposed by the Government, even if it is not in accordance with the principle that side favors. That a plan for unconditional arbitration at the hands of a Government body has been or will be accepted by both sides has also been reported, but nothing of an official character supported such a report.

Still another report has it that the operators have determined that, before they will yield to the demands of the miners, they will open well-located properties now in union fields and resume operations at an early date as non-union mines prepared to combat any trouble that may develop.

British Iron and Steel Market

Pig Iron Again Shipped to United States—Steel, Prices Sagging—Tin Plate Active—Continental Prices Unchanged

(*By Cable*)

LONDON, ENGLAND, July 3.

Pig iron presents no fresh feature, but the freight question is now arranged. Shipment of 2000 tons of Cleveland pig iron from Middlesbrough to Baltimore and 2500 tons to New Orleans is being made. The boats are now loading. There is still some American inquiry for foundry iron, but nothing has been done.

Hematite has an easy tendency. There is some inquiry from Germany. There has been good recent buying of ferromanganese for America and there still is some demand.

Steel shows a little more home inquiry and trade is getting better by degrees, but the export market is dull. The works are inclined to cut prices for desirable specifications.

Tin plate has a good market, with general buying, especially by Portugal, Italy and France. The pooling scheme, including all of the South Wales mills, has been approved and comes into force immediately. The market is firmer, in consequence. A big oil-size inquiry for the Far East probably will be placed here shortly. The mills are running now at about 90 per cent of capacity.

Japanese specifications for black sheets are in request, but galvanized sheets are dull and have an easy tendency.

The Newport Monmouthshire Corporation is in the market for 22,000 tons of cast iron pipe.

Clyde shipbuilding output of the past six months has amounted to 61 vessels, aggregating 167,000 tons, against 118 vessels and 236,000 tons for the first half of last year.

Japanese Government railroads have bought 34 electric locomotives from the English Electric Co., Ltd., London.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $4.42 per £1, as follows:

Durham coke, delivered	£1	7s.				$5.97	
Cleveland No. 1 foundry	4	15				21.00	
Cleveland No. 3 foundry	4	10				19.89	
Cleveland No. 4 foundry	4	7½				19.34	
Cleveland No. 4 forge	4	5				18.79	
Cleveland basic	4	10				19.89	
East Coast mixed	4	14	& £4	13s.*		20.77 &	20.55*
Ferromanganese	15	0				66.30	
Ferromanganese*	14	10	to 14	15		64.09 to	65.20
Rails, 60 lb. and up	7	17½	to 9	10		34.81 to	41.99
Billets	7	0	to 8	0		30.94 to	35.36
Sheet and tin plate bars, Welsh	7	7½				32.60	
Tin plates, base box	0	19½	to 0	20		4.31 to	4.42
						C. per Lb.	
Ship plates	9	0	to 10	0		1.78 to	1.97
Boiler plates	13	0	to 14	0		2.57 to	2.76
Tees	9	5	to 10	10		1.83 to	2.07
Channels	8	10	to 9	15		1.68 to	1.93
Beams	8	5	to 10	0		1.63 to	1.97
Round bars, ¾ to 3 in.	9	5	to 10	0		1.83 to	1.97
Galvanized sheets, 24 g.	15	12½	to 15	15		3.08 to	3.11
Black sheets	12	0				2.37	
Steel hoops	12	0	& 12	5*		2.37 &	2.42*
Co'd rolled steel strip, 20 g.	23	2½				4.56	
Cotton ties, Indian specifications	15	0				2.96	

*Export price.

Continental Prices, All F.O.B. Channel Ports, Delivery as Specified

No. 3 foundry pig iron:						
Belgium, July	£4	12½s.	to £4	15s.	$20.45 to	$21.00
Luxemburg, July	4	12½	to 4	15	20.45 to	21.00
France, July	4	12½	to 4	15	20.45 to	21.00
Basic pig iron:						
Luxemburg, July	4	6	to 4	7	19.01 to	19.23
Billets:						
Luxemburg, July	6	5			27.63	
Lorraine, July	6	5			27.63	
Wire nails (keg basis):						
Germany, August	0	14½			3.20	
Wire rods, 5 mm. (0.2 in.):						
Belgium, July	7	5			32.05	
Angles:					C. per Lb.	
Belgium, July	7	10	to 7	12½	1.48 to	1.50
Tees						
Belgium, July	8	5			1.63	
Channels:						
Belgium, July	7	10	to 7	12½	1.48 to	1.50
Merchant bars:						
Belgium, July	7	13½	to 8	0	1.54 to	1.58
Luxemb'g, July, Aug.	8	0			1.58	
Germany, July, Aug.	8	0	to 8	7½	1.58 to	1.65
France, July	8	5	to 8	10	1.63 to	1.68
Joists (beams):						
France, July, Aug.	7	7½	to 8	0	1.46 to	1.58
Belgium, Ju'y, Aug.	7	7½	to 7	10	1.46 to	1.48
Luxemburg, July	7	15	to 8	0	1.53 to	1.58
Belgium, July	8	2½			1.60	
⅜-in. plates:						
Germany, July, Aug.	9	5			1.83	
Belgium, July	8	0	to 8	2½	1.58 to	1.60
Luxemburg	8	10			1.68	
¼-in. plates:						
Germany	9	0			1.78	
No. 8 gage wire:						
Belgium, July, Aug.	14	10			2.86	

JAPAN STILL BUYING RAILS

Municipalities and Private Railroads Inquire—China Buys Copper—Germany Seeks Scrap

NEW YORK, July 3.—Japan continues to show an increasing interest in purchasing black sheets of light gage. Most exporters to Japan are now handling inquiries totaling 50 or 75 tons up to 1000 or 1500 tons. As a comparison of British and American quotations on black sheets delivered to Japanese ports, an exporter in New York recently obtained a quotation on three inquiries of 70 tons, 50 tons and 30 tons of light gage sheets of $84.70 per ton, c.i.f. Yokohama from an American seller and £16 18s, c. and f. Yokohama (at exchange then prevailing $75.95) from a British seller. Adding 1 per cent to cover insurance on the British shipment their price was about $76.70 per ton, c.i.f. Japan. This difference in price might be discounted somewhat by the fact that the British sheets probably were not one pass cold rolled.

Activity in purchases of rails of all weights, both from Governmental and private sources in Japan, is heavy. One Japanese export house, which has shipped three miles of 30-lb. rails to the Division of Forestry of the Formosan Government is quoting on an additional three miles. A Japanese municipality is asking for prices on about 1500 tons of 82-lb. and 127-lb. grooved rails, Lorain type, and there is an inquiry for 2000 tons of 45-lb. and 60-lb. rails from a privately owned railroad. As a comparison of German and American prices on light rails at present, on a recent inquiry for 12-lb. sections, $45.25 per ton, c.i.f. Yokohama, August-September delivery, was quoted by a German mill against $48.95 per ton, four weeks delivery by an American seller.

The most important railroad construction project planned by the Imperial Government Railways during the coming year, according to the *Trans-Pacific* is the building of the submarine tunnel under Shimonoseki Strait to Kyushu. Another important project is the electrification of the Tokio-Yokohama-Odawara lines and several other suburban lines around Tokio. A freight line is to be built within the year from Sumidagawa freight station to Echujima and the Minister of Railways has granted a charter to the Jomo Electric Tramway Co., to construct a tramway from Mayebashi to Takasaki.

The Chinese market is quiet but still eager to purchase wire shorts. One New York exporter after great difficulty obtained sufficient wire shorts in small lots to fill orders from China totaling 300 tons. There is some interest also in second hand material. There is some copper buying, an inquiry from Shanghai calling for 1000 tons of casting copper, said to be for minting. A small inquiry for grooved rails is being bid upon. The South Manchuria Railway Co. is asking for prices on about 25 tons of soft steel bars.

German copper purchases are still heavy; one buying agent in New York purchased a total of almost 1000 tons last month and may run up to 1500 tons next month. The great majority of these purchases

are in small lots of 75-lb. wire rods with pointed ends. While much of it is being used in Germany some is being re-exported to other European countries.

That Germany would purchase heavily of steel scrap in the United States if sufficiently low prices could be obtained is probable, but thus far no sales are reported to have been made. There is a rumor, however, that a shipment of 19,000 tons of heavy melting steel has been made, which was purchased at $10 per ton, f.a.s. New York. Scrap dealers in this district express considerable doubt that even a low grade of heavy melting steel could have been obtained at this price and point out that the buying office of one German interest has recently offered up to $12 per ton, f.a.s. New York, unsuccessfully. The general scrap shortage throughout Europe is shown in a recent Italian inquiry offering $14 per ton, c.i.f. Italian port.

Belgian pig iron production in April registered a decline from the previous month's figures, being only 113,820 metric tons. The steel ingot production was 90,870 metric tons. The Australian metal industries continue in a difficult situation, says a report of an American trade commissioner. Employers state that the 44-hr. week for 48-hr. pay has crippled the industry, and employees refuse to consent to any reduction in wages or increase in hours of work. The Australian pig iron production which increased from 209,253 tons in 1918 to 352,365 tons in 1921, has practically ceased, because of offerings of pig iron and steel products from overseas at prices with which Australian producers cannot compete.

Brazil Centennial Exposition

The two buildings, which will house the exhibits from the United States at the Brazil Centennial Exposition, Sept. 7, 1922, to March 31, 1923, will cost the United States Government about $1,000,000 and will house exhibits and missions from 29 States and a number of the larger cities, according to Davies, Turner & Co., 29 Pearl Street, New York.

FRENCH PRODUCTION ACTIVE

Buying Dropping Off, But International Competition Not So Severe

PARIS, FRANCE, June 20.

The situation of the French iron and steel market has been improving since the early part of May. This improvement was due partly to a seasonal revival of the structural trades and also to some demands from Germany in semi-finished products and rolled merchant products, but it never assumed large proportions and it seems already to have come to a standstill, after having, however, brought to the producers orders for some months to come. Its influence on prices was very slight, and foundry pig-iron sells even lower now than it did six weeks ago. Of course, so large is the present iron production capacity of France that nothing but the so much hoped for general world revival of trade will put things right again. Meanwhile, the large Lorraine concerns are losing money, as was shown by the report recently submitted to the general meeting of the Knutange iron works.

For the time being, the rise of German prices has lessened the pressure of German iron products on export markets and has permitted Lorraine iron works, such as Knutange, Rombas, Hagondange, etc., to obtain some orders at very low prices, on which they will indeed probably sustain a loss but which will enable them to increase their production. Austrian construction works, for instance, which could not satisfactorily procure pig iron from western Germany, purchased it in the Saar and Lorraine districts.

Iron Ore.—The French production of iron ore in April was 1,379,721 tons, against 1,553,900 tons in March and a pre-war monthly average output of 3,582,000 tons. Stocks, which amounted to 3,911,000 tons at the end of March, have since notably decreased. During the first quarter of 1922, French exports of iron ore totalled 2,104,000 tons (of this 616,000 tons to Germany and 316,000 tons to Belgium).

Pig Iron.—The production of basic pig iron for steelworks is increasing, owing to large orders for semi-finished steel. As regards foundry pig iron, the demand is not important and small stocks exist at blast furnaces. The tendency is rather to restrict the production than to increase it. The current price for chill-cast foundry pig-iron, No. 3 P. L., is 215 to 220 frs., but the price of 210 frs. ($17.85 per metric ton) has been done.

Belgian foundry pig-iron is now worth 230 to 235 frs. (Belgian currency), or 216 to 220 frs. (French currency). Lorraine foundry pig-iron for export is now approximately 235 frs. (French currency) f. o. b. Antwerp. Cleveland pig-iron, No. 3 G. M. B. is now worth 109s c.i.f. Antwerp, or 340 frs. (French currency) at the Franco-Belgian frontier, which, of course, hardly gives it a chance to compete with French pig-iron on inland markets.

Inquiry for hematite pig-iron is very quiet. British competition, notwithstanding the rise of the pound sterling, is still to be reckoned with. An actual offer of British hematite at 315 frs. c.i.f., Havre, is reported. Orders were booked by French producers at 305 to 315 frs. in the East; 295 to 305 frs. in the Northern and Western coast areas (where British hematite most easily penetrates), and 325 to 330 frs. in the Central and Parisian areas.

Semi-finished Steel.—Prices are firm, and producers are well supplied with orders. Last published prices per metric ton for mild steel products are:

	Domestic	Export	Export equivalent
Blooms	320 to 325 fr.	310 to 320 fr.	$26.35 to $27.20
Billets	340 to 350	320 to 330	27.20 to 28.05
Flat bars	350 to 370	350 to 355	29.75 to 30.20

Beams.—The market is moderately active. The base price is 475 frs. (1.80c. per lb.), equivalent to an average of 420 to 430 frs. at producing works.

Rails.—French railroad companies are now preparing extensive orders for rails which they will allocate shortly. The base price is 540 to 550 frs. ($45.90 to $46.75) per ton delivered.

Sheets and Plates.—The home market for sheets is now much better, and the rise of both the British pound and the Belgian franc has tended to check foreign competition. Small orders for plates have been given by French private shipbuilding yards, but the trade is still eagerly awaiting the orders relative to the carrying out of the new French naval program, which were delayed by extensive tests on plates intended for the new large submarines. Base prices of the Comptoir des Toles et Larges Plats are:

Thick sheets	640 frs.	(2.40c. per lb.)
Medium sheets	720 frs.	(2.78c. per lb.)
Thin Sheets	900 frs.	(3.48c. per lb.)

These are for mild steel products, delivered at an averaged distance French consuming center.

Rolled Merchant Products.—The demand has calmed down. However, in May and early June producers booked orders that will carry them into the fall. The current price is 420 to 430 frs. (1.62c. to 1.66c. per lb.), at producers works.

Steel Wire.—The market is moderately active. The current price is 460 to 480 frs. (1.77c. to 1.86c. per lb.), at producers works.

Coke.—The adjusted price of coke to be supplied to French blast-furnaces has been increased from 90 frs. ($7.65 a ton) for June, to 93 frs. ($7.90) for July, at the Franco-German frontier. This is due to a rise of the German home price. French production of coke from collieries' ovens is now at the rate of only 800,000 tons per annum, while it was over 2,500,000 tons before the war.

Pourparlers are now going on between the Italian and French iron and steel trades with a view of entering into an greement for safeguarding the existence of Italian ironworks and avoiding a tariff strife between the nations. French representatives seem quite ready to fall in with the views of their Italian colleagues, provided they be granted the possibility of exporting to Italy some raw products and semi-finished material of such specifications, however, as Italy does not produce herself.

Iron and Steel Markets

NEW UNCERTAINTIES

Fuel Situation Confused—Large Pig Iron Gain in June

Pressure on the Mills Keeps Up—New Chicago Business in Large Volume

The events of the week have brought new uncertainties into the situation, after a month in which output of pig iron and steel were at the highest rate since December, 1920. Hopes of a settlement of the coal strike have not been raised by the first contacts at Washington, and the strike of railroad shop employees temporarily strengthens the will of the miners to remain out. Western Pennsylvania coal loadings showed no increase last week, and meanwhile holiday absences of workers have reduced production.

In the Pittsburgh district a good many rolling mills suspended operations from Saturday to Wednesday, thus adding to the arrearages on their order books.

The June pig iron figures bear out all that was said in that month of the gains being made at blast furnaces. For the 30 days output was 2,361,028 tons, or 78,701 tons per day, against 2,306,679 tons in the 31 days of May, or 74,409 tons per day. The Steel Corporation added five furnaces to its active list in June, the independent steel companies seven and the merchant pig iron producers five. The capacity of the 192 furnaces active on July 1 was 81,845 tons per day, against 77,520 tons per day for 175 furnaces on June 1.

Pig iron production is now at the rate of nearly 30,000,000 tons per year, which is between the rate of December, 1920, and that of January, 1921.

Producers are not attempting to predict the effect of the railroad strike upon transportation. Some slight congestion is reported and the interruption of raw and finished material movement is recognized as a possible factor.

Both coal and coke prices are higher in view of this week's holiday. Little furnace coke can be had at less than $8.50, and $9 has been paid. In the Pittsburgh district the minimum for coal is $4, and Southern coal has advanced 50 cents to $3.75 at mine.

The effect of coal shortage on the operations of consumers of iron and steel is having more consideration. Producers are better provided for than are those who buy from them. Thus far, however, there has been no lessening of the pressure upon steel mills for early deliveries.

Chicago mills in particular have felt this urging. For a large company there last week was one of the heaviest of the year in new business booked.

Greater variations appear in prices of plates, shapes and bars, especially for July and August delivery, in view of advances made by certain independent companies and the course of the Steel Corporation in holding back.

Further sheet bar sales are reported at $35 in the Central West, while the Steel Corporation's third quarter price is $33. On wire rods $40 is the general market, but the leading producer's price is $38.

With 5000 more freight cars bought in the week, the total of nearly 100,000 since January 1 shows a good margin over the six months average of the ten years before the war. It represents a rate of buying nearly three times that of the last five years.

Rail mills have been kept busy, particularly in the West. The Algoma mill at Sault Ste. Marie has a 48,000-ton order from the Canadian Pacific.

Structural steel lettings totaling 24,000 tons for the larger projects and new inquiries for 11,000 tons show no noticeable let up in fabricated steel activity.

Iron puddlers will receive $8.53 per ton in July and August as the result of the bi-monthly wage settlement of last week, an advance of 90 cents. The average price of bar iron in the April 20-June 20 period was 1.604c.

With costs of pig iron rapidly advancing, due principally to high coke, prices are tending upward and at Chicago have advanced 50c. on foundry, malleable and basic grades, while Southern iron has also been marked up at least 50c. The importing of moderate tonnages of foreign iron and contracts for additional amounts are acting as a check on the market. In steel making irons, inquiries in the Pittsburgh district include 7000 tons of basic and 1500 tons of Bessemer. In Philadelphia, a Steel Corporation subsidiary has purchased 10,000 tons of basic. With the reduced freight rates, Southern iron promises to be a more important factor in the Northern market.

The iron ore movement down the Lakes is heavy, June shipments amounting to 6,629,000 tons, or 3,000,000 tons more than in June, 1921. Some large orders for ore are still held back in view of fuel uncertainties.

Pittsburgh

Prices of Independents Inclined to Advance — Steel Corporation Holds Back

PITTSBURGH, July 3.—It is a common thing to hear the present steel situation referred to as a modified repetition of the 1920 condition. Independent company prices in most lines continue to grow stronger, while the Steel Corporation is inclined to hold back. The failure of the Washington coal conference to develop any material change in the attitude of either the operators' or miners' representatives toward settlement terms, coupled with the threat of the transportation difficulties contained in the walkout of the railroad shopmen, has the trade more or less at sea as to what is immediately ahead. Sentiment is not as hopeful as a week ago of an early ending of the coal strike, and there are fears that without the inspection of motive power done in railroad shops, difficulties soon will develop in the movement of materials.

These conditions promote conservatism on the part of the steel mills about further adding to their obligations, except at prices sufficiently high to at least cover costs. This week will result in a further falling behind on the part of the mills in regard to their booking, because outside of the blast furnaces there has been almost complete suspension of operations which began at noon last Saturday and runs over to Wednesday

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	July 3, 1922	June 27, 1922	June 6, 1922	July 5, 1921
No. 2X, Philadelphia‡	**$27.64**	$27.82	$26.26	$25.50
No. 2, Valley furnace†	24.00	24.00	24.00	21.00
No. 2, Southern, Cin'ti†	**22.55**	22.50	23.00	25.50
No. 2, Birmingham, Ala.†	**18.50**	18.00	18.50	21.00
No. 2 foundry, Chicago*	**24.00**	23.50	23.00	20.00
Basic, del'd, east'rn Pa.	**25.75**	25.00	25.00	23.50
Basic, Valley furnace	25.00	25.00	25.00	20.00
Valley Bessemer, del. P'gh	*26.77*	26.96	26.96	23.46
Malleable, Chicago*	**24.00**	23.50	23.00	20.00
Malleable, Valley	24.50	24.50	24.50	21.50
Gray forge, Pittsburgh	*25.27*	25.46	25.46	21.96
L. S. charcoal, Chicago	*31.65*	32.00	29.00	37.50
Ferromanganese, seaboard	67.50	67.50	67.50	70.00
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$40.00	$40.00	$40.00	$47.00
Bess. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. billets, Pittsburgh	35.00	35.00	35.00	33.00
O.-h. sheet bars, P'gh	35.00	35.00	35.00	35.00
Forging billets, base, P'gh	40.00	40.00	40.00	38.00
O.-h. billets, Philadelphia	*40.17*	40.74	40.74	38.74
Wire rods, Pittsburgh	40.00	40.00	38.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	1.70	1.70	1.70	2.00
Light rails at mill	**1.70**	1.60	1.50	2.20
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	*1.925*	1.96	1.96	2.25
Iron bars, Chicago	**1.80**	1.75	1.70	2.10
Steel bars, Pittsburgh	1.70	1.70	1.70	1.90
Steel bars, Chicago	1.75	1.75	1.75	2.28
Steel bars, New York	*2.04*	2.08	1.98	2.28
Tank plates, Pittsburgh	1.70	1.70	1.60	1.90
Tank plates, Chicago	1.75	1.75	1.75	2.28
Tank plates, New York	*2.04*	2.08	1.98	2.28
Beams, Pittsburgh	1.70	1.70	1.60	2.00
Beams, Chicago	1.75	1.75	1.75	2.38
Beams, New York	*2.04*	2.08	1.98	2.38
Steel hoops, Pittsburgh	**2.50**	2.40	2.40	2.50

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	July 3, 1922	June 27, 1922	June 6, 1922	July 5, 1921
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.15	3.15	3.15	3.50
Sheets, galv., No. 28, P'gh	4.15	4.15	4.15	4.50
Sheets, blue an'l'd, 9 & 10	2.40	2.40	2.40	2.65
Wire nails, Pittsburgh	2.40	2.40	2.40	3.00
Plain wire, Pittsburgh	2.25	2.25	2.25	2.75
Barbed wire, galv., P'gh	3.05	3.05	3.05	3.65
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$4.75	$5.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	**$18.50**	$18.25	$18.25	$13.25
Carwheels, Philadelphia	17.50	17.50	17.00	18.00
Heavy steel scrap, P'gh	**17.50**	17.00	17.00	12.00
Heavy steel scrap, Phila.	15.00	15.00	15.00	11.00
Heavy steel scrap, Ch'go	**15.00**	14.75	14.50	10.00
No. 1 cast, Pittsburgh	19.00	19.00	18.50	16.00
No. 1 cast, Philadelphia	*17.50*	19.00	19.00	16.00
No. 1 cast, Ch'go (net ton)	**17.00**	16.50	16.00	12.50
No. 1 RR. wrot, Phila	17.00	17.00	17.00	13.50
No. 1 RR. wrot, Ch'go (net)	**13.50**	13.25	12.50	9.50
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	**$8.50**	$7.50	$6.50	$3.00
Foundry coke, prompt	**9.00**	8.00	7.00	4.25
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	13.75	13.75	14.00	12.75
Electrolytic copper, refinery	13.50	13.50	13.75	12.62½
Zinc, St. Louis	**5.35**	5.27½	5.32½	4.35
Zinc, New York	**5.70**	5.62½	5.67½	4.85
Lead, St. Louis	5.55	5.55	5.50	4.25
Lead, New York	*5.75*	5.80	5.80	4.40
Tin (Straits), New York	....	31.00	32.50	29.87½
Antimony (Asiatic), N. Y.	5.00	5.00	5.25	4.75

Composite Price, July 3, 1922, Finished Steel, 2.169c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

June 27, 1922,	2.169c.
June 6, 1922,	2.141c.
July 5, 1921,	2.557c.
10-year pre-war average,	1.689c.

Composite Price, July 3, 1922, Pig Iron, $24.19 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

June 27, 1922,	$24.05
June 6, 1922,	23.79
July 5, 1921,	21.08
10-year pre-war average,	15.72

morning. Demand for bars and shapes still is very insistent and no considerable salesmanship skill is necessary these days to sell pipe. In other lines, however, there has been something of a pause, if not in the buying, at least in the urgency of buyers. That buyers have been holding back specifications until after July 1, to secure the advantage of the lower freight rates, is not verified by the reports of railroads which note no very marked variation from the recent rate of traffic.

The pig iron market has been featured by the appearance of two or three fair sized inquiries for the steel making grades, but with no actual gain in business. Prices are sustained chiefly by high costs, notably of coke, which is costing Valley furnaces at least $10, and in some instances more, delivered. Expectation of an early revival of buying is reflected in a stronger undertone to the scrap market.

Pig Iron.—The N. & G. Taylor Co., Cumberland, Md., is in the market for 5000 tons of basic for delivery over the present quarter, 2000 tons this month, 2000 tons in August and 1000 tons in September; the Edgewater Steel Co. has put out an inquiry for 2000 tons of basic for immediate shipment, and a middle interest has been asking quotations on 1500 tons of standard Bessemer. None of this business yet has been closed. Valley producers generally are quoting $25, furnace, for both basic and Bessemer, and suggestions that the former grade can be bought at $23 are believed to refer to a block of off-grade basic lying at the plant of one of the Youngstown district steel companies. Some of the merchant furnaces have entered reservations for their regular customers on foundry iron for the third quarter, on a basis of $24, Valley furnace, No. 2. The recent inquiry for 500 tons of gray forge iron by a wrought iron pipe manufacturer has been largely placed at $23.50, Valley furnace. The market on malleable iron is not quotable above $24.50, a local consumer who was quoted $25, Valley furnace, against a recent inquiry claiming that he had bought at $25, delivered. W. P. Snyder & Co. report the average price of both basic and Bessemer iron from Valley furnaces in June to have been $25 as compared with the May averages of $24.91 for basic and $24.40 for Bessemer.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$25.00
Bessemer	25.00
Gray forge	$23.50 to 24.00
No. 2 foundry	24.00
No. 3 foundry	23.50 to 24.00
Malleable	24.50

Ferroalloys.—Prices of English ferromanganese are inclined to stiffen as a result of the recent heavy purchases prompted by the fear of a high duty in the new tariff. We note one sale of 100 tons for early delivery at $70 c.i.f. Philadelphia and it is reported some of the English producers have advanced the price for August shipments or September deliveries to $72.50, because they are practically sold up against probable production over the next six weeks. The old price of $67.50, however, still is named by most English makers. Very little spiegeleisen is available for early delivery and prices are very firm and likely to advance if the proposed duty on ferromanganese is allowed to stand. This duty of $33.60 would mean a price for ferromanganese of more than $100, and present spiegeleisen prices would be out of line. Interest in other ferroalloys is almost nil.

We quote 78 to 82 per cent ferromanganese, $67.50 c.i.f. Atlantic seaboard for domestic and $67.50 to $70 for English. Average 20 per cent spiegeleisen, $36 furnace; 16 to 19 per cent, $35 furnace; 50 per cent ferrosilicon, domestic, $55 to $60 furnace, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, $41.50; 11 per cent, $44.80; 12 per cent, $48.10; 13 per cent, $52.10; 14 per cent, $55.10; silvery iron, 6 per cent, $30; 7 per cent, $31; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39; 12 per cent, $40.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Structural Material.—There is an unusually wide variation in quotations. Contracts are known to be outstanding at 1.50c. while the Steel Corporation price is supposed to be 1.60c. and independents are at 1.70c., 1.75c. and 1.80c. Only tonnages that are attractive from a mill standpoint, however, can be placed as low as 1.60c., and 1.70c. is the going minimum upon such tonnages as are coming out. Fabricating shops in this district are fairly busy, although the bulk of the orders is for small tonnages. Plain material prices are given on page 55.

Plates.—High costs and the fact that a number of mills cannot be operated profitably at present prices, together with the sold-up condition of mills in operation, account for the strength of the market rather than the demand. New business actually is moderate in this district. Really attractive tonnages can be placed as low as 1.60c., but the inquiries coming out generally are unattractive, and on these 1.70c., Pittsburgh, is minimum. Prices are given on page 55.

Sheets.—The supply situation is tight, because mill booking are sufficient in the case of the American Sheet & Tin Plate Co. to sustain the recent rate of operations of about 90 per cent of capacity right through the present quarter, without additional orders, while orders of the independents represent practically two months' operations at the recent rate of more than 80 per cent. With labor shortages developing and hot weather ahead, the indications are that much business will be unfilled at the end of the quarter. This week's production will be low at all mills because the mills that did not suspend Saturday for the holiday had only a small number of men at work today. All makers of automobile sheets are far behind because few automobile makers were prepared for the business they have taken. The American Sheet & Tin Plate Co. still is quoting automobile body stock at $4.50 base, but cannot ship promptly on new business, while independents are quoting and obtaining $4.75 to $4.85. Premiums of $3 to $5 a ton over regular quotations still are being asked by some independents for early shipments, but only small tonnages are moving at the higher figures. Prices are given on page 55.

Tin Plate.—The market is quiet, although some makers are beginning to get specifications on August and September shipments. On such order for 100,000 boxes recently was placed. The Northwest is reported to have a heavy crop of berries and other small fruit this year and one big can company will ship at least 50,000,000 more cans into that district than were called for on the original orders. The weather is reported favorable for tomatoes, but there has been so much rain that there is doubt about the size of the green corn pack. Uncertainty about the canning crops is what is holding up tin plate business at present. There is no weakening in prices because the present base of $4.75 per base box is claimed to be low enough on today's material and labor costs. This price was quoted when sheet bars and fuel were much cheaper than at present.

Hot-rolled Flats.—Prices have strengthened further since last reports, with 2.50c base Pittsburgh, now the minimum of the independent makers on new business and as high as 2.75c being obtained on the light gages of narrow material, where early shipment is demanded. There has been no formal announcement with regard to prices on these products by the Steel Corporation, but it is reported to be heavily committed and is not a factor as far as early shipments are concerned. Its last formal quotation was 2.25c base. Announcement of the price on cotton ties is waited with much interest. On the basis of 2.50c for hoops, plus the extra of 35c. per 100-lb. for 15/16-in. 19 gage, the price would be about $1.28 per bundle of 45-lb. It is believed that the operating price would be about $1.30.

Wire Rods.—Independents have put the base on common soft rods to $40 Pittsburgh and Youngstown, and this advance has been adopted informally by the American Steel & Wire Co. The former extras of $5 per ton for screw stock rods and of $7 to $10 per ton for high carbon steel are preserved. The new prices are on contracts and more probably would be asked on other business.

We quote No. 5 common basic or Bessemer rods to domestic consumers $40, chain rods $40; screw stock rods, $45; rivet and bolt rods and other rods of that character, $40; high carbon rods, $47 to $50, depending on carbon, per gross ton, f.o.b. Pittsburgh or Youngstown.

Wire Products.—The American Steel & Wire Co. last week reduced the price of woven wire fence $5 per ton and inaugurated fall datings against new purchases. This action was accompanied by a withdrawal of all price guarantees previously in effect. Independent makers have fallen in line, the new discount being 73 per cent off list for car loads to jobbers and 70½ per cent off list on carloads to dealers. Prices of wire products have pretty generally settled to the bases long observed by the American Steel & Wire Co. Independents still are quoting advances over these levels of $2 a ton on all lines except plain wire, but demand is not stout enough to sustain the premiums. Prices are given on page 55.

Semi-Finished Steel.—Reports as to demand vary, but that the edge is off is the prevailing idea, and while prices are firm, this is due more to the influence of costs than because of a pressing demand. In a general way, $35 still is a fair appraisal of prices for billets, sheet bars and slabs. A Youngstown maker has taken considerable business in sheet bars in the East at $37.50, Youngstown, and sales are also reported up to $38, Pittsburgh. On the other hand, a middle interest who recently was appealed to by a maker to find an outlet of 2000 tons for prompt shipment had much difficulty in making the sale at $35. Steel production is still high despite the coal strike and some companies have small supplies over contract requirements. A lake front producer recently had slabs and billets in moderate tonnages for early delivery. Forging billets and blooms are stronger with sales reported as high as $45 mill or about $44, Pittsburgh, and even $48, mill, was paid for a small lot, probably because of a freight advantage to destination enjoyed by the maker. An Allegheny Valley sheet maker is understood to have closed for his third quarter sheet bar requirements with a western Pennsylvania mill at $35, and the Steel Corporation price to regular customers for the present quarter is reported to be $33.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $35; 2 x 2-in. billets, $35; Bessemer and open-hearth sheet bars, $35; slabs, $35; forging billets, ordinary carbons, $40, all f.o.b. Youngstown or Pittsburgh mills.

Cold-rolled Strips.—The price is unchanged at 4c., base, Pittsburgh, despite the advance of $2 per ton in hot-rolled strips. Premiums for delivery are rare, as the peak of automotive industry activities has been reached and this as well as other consuming industries are covered by contracts against normal third quarter requirements.

Iron and Steel Bars.—While demands for some other lines have diminished, mills still are besieged by buyers for steel bars and deliveries are becoming

more deferred, some makers now being unable to definitely assure shipments until late in September. Little headway will be made toward cutting down obligations this week, as few of the mills in this district will start up before Wednesday and some will be down all this week. If 1.60c. can be done at all, it is against deliveries too far away to interest buyers, most of whom want early shipments. We regard the quotable market as 1.70c. to 1.80c. base, Pittsburgh. Reinforcing bars from new steel command the same price with those rolled from old rails held at 1.60c., iron bars are firm, this being due chiefly to higher costs, through demand is gaining.

We quote steel bars rolled from billets at 1.70c. to 1.80c.; reinforcing bars, rolled from billets, 1.70c. to 1.80c. base; reinforcing bars, rolled from old rails, 1.60c.; refined iron bars, 2.20c. in carloads, f.o.b. mill, Pittsburgh.

Steel Rails.—Light rails rolled from billets now are not available under 1.70c. base, the company recently quoting 1.60c. having gone to 1.70c. since a week ago. The Carnegie Steel Co. and the Cambria Steel Co. are quoting 1.75c. Business is not heavy, but there is a fairly good demand for early tonnages for shipment to coal mines in operation. These rails rolled from old standard sections are held at 1.60c.

We quote 25 to 45-lb. sections, rolled from new steel, 1.70c. to 1.75c. base; rolled from old rails, 1.50c. to 1.60c. base; standard rails, $40 per gross ton mill for Bessemer and open-hearth sections.

Iron and Steel Pipe.—There is no decrease in the insistency of the demand and independent makers of steel pipe are sold ahead on full weight pipe on the average about 10 weeks. The leading interest is quite as heavily committed on those sizes, finding the principal use in house and building construction. Oil and gas line pipe and oil well pipe are in almost as good demand as full weight goods. Wrought iron pipe is in steady demand. Prices are very firm, not only because of the heavy demand and sold up condition of makers, but because costs are high on account of the fuel situation and labor shortages. Discounts are given on page 55.

Cold-Finished Steel Bars and Shafting.—The recently established base of 2.10c., Pittsburgh, for carload lots, is well maintained, but it would be some exaggeration to call the market strong, since buyers usually can find accommodation, even for early delivery, at that price. The demand is good, but supplies appear ample. Ground shafting is unchanged at 2.50c., base, mill, for carload lots.

Nuts and Bolts.—Makers here have a comfortable business, but do not find the demand especially urgent from buyers in this immediate territory. Strength in bars, rods and bolt wire largely explains the firmness of nut and bolt prices here. Discounts are given on page 55.

Rivets.—Leading makers still report the demand to be good and that recent advances in prices in no way are restricting purchases. Prices are unchanged on heavy rivets and on small rivets, 70 and 5 per cent off list is becoming a more general price. Prices and discounts are given on page 55.

Spikes and Track Bolts.—Some makers of track bolts here now are holding to a minimum of $3.25, base, per 100 lb. for track bolts in carload lots, but the recent minimum of $3 still is being named by others, especially in competitive territory. Standard railroad spikes do not find much sale at higher than $2.25, base, per 100 lb. Prices are given on page 55.

Boiler Tubes.—The advances recently announced in seamless steel tubes by the Pittsburgh Steel Products Co. have been followed by other makers, but are not yet very well established, since it is believed consumers were allowed to cover probable requirements fairly well ahead at the previous prices. Steel skelp is short and firm and this is reflected in a stronger trend to lap welded steel tubes. The demand for charcoal iron tubes is helped by the stronger market in steel tubes. Discounts are given on page 55.

Steel Skelp.—Supplies still are extremely limited and 1.70c. now appears to be the minimum on both grooved and sheared material, at least of the independent makers. Some are asking 1.80c. The Steel Corporation is believed to be meeting the requirements of its regular customers at around 1.65c. for sheared and 1.70c. for grooved.

Coke and Coal.—Production has made no further gains since last week; on the contrary, it seems to have slipped back slightly during the past few days and prices have again stiffened. Available supplies of beehive oven coke have dwindled almost to the vanishing point and in anticipation of further decrease this week on account of the holiday, producers have had little trouble in obtaining fully a dollar a ton above the prices of a week ago. Very little furnace grade coke is available today at less than $8.50 and on most sales $9 has been the price. On spot tonnages of foundry grade, anywhere from $9 to $10 has been done in the past few days. On nearby coal the market is at a minimum of $4 per net ton at mines, for either steam or by-product grade, and as high as $5 at mines has been paid for a few small tonnages of nearby lump gas coal. Southern coal, which a week ago ranged from $3.25 to $3.50, now commands from $3.75 to $4 at mines.

Old Material.—Although interest in the market on the part of melters still appears to be passive, there is a plainly stronger undertone to prices of the steel works and blast furnace grades, due to expectations of another buying movement in the near future. A decline in the demand from Youngstown and Canton mills has resulted in no appreciable increase in offerings in this market from the West, nor has a similar development East brought freer offerings from that direction. Some dealers have paid as high as $18 to cover on short sales of heavy melting steel and while the current demand from the mills is light and a few cars have been sold as low as $17, round tonnages do not appear available below $17.50. As high as $20 is said to have been offered for railroad knuckles and couplers. Definite bids of $16.50 for cast iron borings, $18 for heavy breakable cast and of $14 for machine shop turnings have been made without bringing out much material. Cast scrap is less eagerly sought for open-hearth use than recently, but prices are sustained by light supplies. July railroad lists are substantial. It is said that those who bought the June scrap of one line paid a premium to the road to defer demanding shipping instructions until after July 1. A movement is on foot to get the railroads to cut their wrought scrap to 3-ft. lengths, the basis being that this preparation would make the material more readily marketable and mean higher returns to the roads.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows per gross ton:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$17.50
No. 1 cast, cupola size	$19.00 to 20.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	17.00 to 17.50
Compressed sheet steel	15.50 to 16.00
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	19.00 to 19.50
Railroad coil and leaf springs	19.00 to 19.50
Low phosphorus standard bloom and billet ends	20.00 to 21.00
Low phosphorus plates and other grades	19.00 to 20.00
Railroad malleable	16.50 to 17.00
Iron car axles	26.00 to 27.00
Locomotive axles, steel	24.00 to 25.00
Steel car axles	17.50 to 18.00
Cast iron wheels	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Machine shop turnings	14.00 to 14.50
Sheet bar crop ends	18.50 to 19.00
Heavy steel axle turnings	15.50 to 16.00
Short shoveling turnings	15.50 to 16.00
Heavy breakable cast	18.50 to 19.00
Stove plate	15.00 to 15.50
Cast iron borings	16.00 to 16.50
No. 1 railroad wrought	15.00 to 15.50

The initial statement of the Durant Motors of Canada, Toronto, Ont., covering operations for the two months ending April 30 last, indicates that the company has closed a satisfactory amount of business within the limited period of operation. The plant opened March 1, and in the period of two months total revenue from the sale of cars and parts, with receipts from other operations, amounted to $652,944.

Chicago

Pig Iron Advanced Half Dollar—Strike Expected to End Soon

CHICAGO, July 3.—Although the railroad shopmen have struck and they may be joined by the maintenance of way employees, the signalmen and clerks, they are expected to encounter the vigorous opposition of the Government, inasmuch as they have defied the Railroad Labor Board, a Government bureau. Railroads entering Chicago are moving energetically to replace their striking employees. A number of lines have advertised for shopmen and labor agencies are busy recruiting labor at the Railroad Labor Board wage scales. A typical advertisement by the New York Central points out that the strikers left the service in defiance of the United States Board and it promises sanitary housing with ample police protection at all times. It also quotes the Labor Board as stating that men taking the place of the strikers will not be considered as strike breakers but will be regarded as doing a public good.

In view of the attitude of the Government, it is felt that the railroad strike will be short lived. Efforts at Washington to settle the coal strike have also tended to reassure those whose business outlook has been rendered uncertain by the fuel shortage. Much as government interference in industry is opposed, it is generally felt that emergencies have arisen which demand prompt and decisive action.

There are no new developments in the finished steel market. Demand is still insistent and one large local producer reports last week one of the heaviest in the year in new business booked. Rapidly rising costs due in large part to the coal strike have resulted in another 50c. advance in pig iron. Steel works and blast furnace operations are unchanged.

Pig Iron.—Unabated demand and rising production costs have resulted in another advance of local iron to $24, base furnace, for future delivery and $25, for prompt shipment. While it is true that some melters have been frightened by the coal and transportation strikes, others are sending in repeat orders or are asking furnaces to anticipate shipments against contracts. Conservatism no doubt actuates the policy of most buyers, but the very fact that their orders represent actual needs makes the volume of present demand particularly impressive. Buying of spot iron is especially active. Foundry operations in this territory have reached a high level, the principal limitation on melt being a shortage of labor which is most pronounced among the malleable shops. Recent bookings of furnaces range from carloads up to several thousand tons. A local melter has closed for 1,500 tons of foundry for third quarter delivery and another Chicago user wants 2,000 tons for last half. An Indiana melter is in the market for from 1,000 to 1,200 tons of malleable for August and September shipment and a plow maker wants 300 to 500 tons of foundry for delivery at a Wisconsin plant during third quarter. Although most Southern producers are quoting and booking business at $20 base, Birmingham, foundry can still be bought from one maker at $18 Birmingham, and from at least one other furnace at $19. Thus with the new freight rate of $6 from Birmingham Southern foundry can be laid down in Chicago at $24, or at a parity with the local furnace price. There is a strong probability that the freight from Birmingham will be further reduced, as the Southern Railway has announced a new rate of $4.22 from Birmingham to St. Louis, or nearly $1 less than the rate which would have obtained under the 10 per cent reduction. The Buick Motor Co. has closed for 1,500 tons of silvery for last half requirements at the full Jackson County schedule. A Milwaukee melter is inquiring for 100 tons of low phosphorus for prompt shipment. The Thomas Furnace, Milwaukee, has set no definite date for a resumption of operation, apparently delaying action pending strike developments.

Copper free low phosphorus is quoted at from $34 to $35, Valley. The Wisconsin Steel Works is no longer offering its Sunday make for merchant consumption as it requires its entire output for steel production. Only one of its three furnaces is active at present with a second scheduled to go in about Aug. 15.

Quotations on Northern foundry, high phosphorus malleable and basic irons are f.o.b. local furnace and do not include a switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$31.65
Northern coke, No. 1, sil. 2.25 to 2.75	$24.50 to 25.50
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	24.00 to 25.00
Northern high phos	24.00 to 25.00
Southern No. 2	24.00 to 26.00
Malleable, not over 2.25 sil	24.00 to 25.00
Basic	24.00 to 25.00
Low phos. Valley furnace, sil. 1 to 2 per cent copper free	34.00 to 35.00
Silvery, sil. 8 per cent	37.29

Ferroalloys.—Ferromanganese for prompt shipment is bringing as high as $72.50 and $75 base seaboard. For September delivery a relatively small amount can still be bought at $67.50 seaboard, but the more general quotation is $70, the duty to be assumed by the buyer in each instance. Spiegeleisen is quiet after considerable buying. Owing to the inactivity of the market it is difficult to ascertain the ruling price on 50 per cent ferrosilicon. On prompt material quotations range from $57.50 to $62.50 delivered and on last half contracts $55 is named.

We quote 78 to 82 per cent ferromanganese, $77.56, delivered; 50 per cent ferrosilicon, $55 to $62.50, delivered; spiegeleisen, 18 to 22 per cent, $46.50 to $47, delivered.

Bars.—Demand for soft steel bars is heavy with prompt material difficult to obtain. Bar iron has again advanced $1 a ton to 1.80c., Chicago, with buying heavy and mills working to the limit of their present possible capacity. Hard steel bars are firm with mills well booked ahead.

Mill prices are: Mild steel bars, 1.75c. to 1.85c., Chicago; common bar iron, 1.80c., Chicago; rail carbon, 1.70c., mill or Chicago.

Jobbers quote 2.48c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.40c. for rounds and 3.90c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.38c. base. Hoops, 3.48c. Bands, 3.23c.

Bolts and Nuts.—Specifications were exceptionally heavy last week, reflecting the desire of buyers to get the benefit of the old discounts. After the heavy buying up to July 1, business is expected to be less active for a time. The ruling discounts are the same as those on page 55, except that they are on a Chicago base.

Jobbers quote structural rivets, 3.10c.; boiler rivets, 3.20c.; machine bolts up to ¾ x 4 in., 50, 10 and 10 per cent off; larger sizes, 50 and 10 off; carriage bolts up to ¾ x 6 in., 50 and 5 off; larger sizes, 45 off; hot pressed nuts, squares and hexagons, tapped, $3.25 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 per cent off; quantity extras are unchanged.

Wire Products.—The leading interest has advanced wire rods to $40 a ton, but has reduced woven wire fencing by increasing the discount 2½ points to 70½ per cent off to consumers and 73 per cent off to jobbers. Demand for nails and plain wire is strong. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 55.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.10 per 100 lb.; No. 9 and heavier bright basic wire, $3.25 per 100 lb.; common wire nails, $3.25 per 100 lb.; cement coated nails, $2.75 per keg.

Sheets.—The local independent is out of the market and consumers are experiencing difficulty in placing their business with any mill, particularly when third quarter delivery is desired.

Mill quotations are 3.15c. to 3.30c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.15c. to 4.30c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote blue annealed, 3.63c.; black, 4.45c.; galvanized, 5.45c.

Structural Material.—Construction activity is in full swing as evidenced by the fact that Chicago building permits in June broke all previous records. Fabricating shops have considerable work ahead, and mills are choked with orders for plain material.

The mill quotation on plain material is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plain material out of warehouse.

Plates.—Demand is still strong, one of the leading local producers reporting that last week was one of the heaviest in the year in new business booked. Much of this tonnage is coming from railroad car-builders and is being taken for indefinite delivery with the probability that shipments will be actually made late in the year. The Marland Refining Co., Oklahoma City, Okla., has let 20 small tanks, requiring 600 tons of steel, to the Chicago Bridge & Iron Works.

The mill quotation is 1.75c. to 1.85c., Chicago. Jobbers quote 2.58c. for plates out of stock.

Cast-Iron Pipe.—New municipal work consists largely of small tonnages for smaller cities, the larger municipalities with a few exceptions having covered their needs. Orders from private sources are still large. The market is strong at $37 to $38, Birmingham, for 6-in. and larger. Premiums of $2 to $3 a ton are being obtained for early shipment, as pipe shops are well booked ahead. Freight rates from Birmingham have been reduced 90c. a ton, so that the minimum Chicago delivered price quoted below is lower than that published a week ago. Chicago will soon enter the market for 500 tons, and Lake Forest, Ill., has taken bids on 100 tons. The United States Cast Iron Pipe & Foundry Co. is low bidder on 100 tons for Hammond, Ind.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $49.20 to $50.20; 6-in. and above, $45.20 to $46.20; class A and gas pipe, $3 extra.

Rails and Track Supplies.—Buying of spikes, bolts, tie plates and angle bars is brisk, orders for standard spikes ranging up to 16,000 kegs and for track bolts up to 12,000 kegs.

Standard Bessemer and open-hearth rails, $40; light rails rolled from new steel, 1.75c., f.o.b. makers' mills.
Standard railroad spikes, 2.16c. to 2.25c., Pittsburgh; track bolts with square nuts, 3.16c. to 3.25c., Pittsburgh; tie plates, steel and iron, 1.85c., f.o.b. mill; angle bars, 2.40c., f.o.b. mill.

Steel Castings.—Considerable business has been closed to get the benefit of the discounts effective until July 1. On outstanding quotations on car castings, however, buyers have been given the privilege to close at the old discounts until July 15. The general tone of the market is firm, although there are isolated instances of price cutting.

Reinforcing Bars.—Recent awards include: Kalamazoo, Mich., Vegetable Parchment Co. plant, 750 tons, to Rochester Bridge Co.; University of Minnesota Library Building, 400 tons, to Concrete Steel Co.; Manitowoc, Wis., High School, 175 tons, to Truscon Steel Co.; Mercy Hospital, Oshkosh, Wis., and State Highway Bridge, Ixonia, Wis., 100 tons each, to Corrugated Bar Co.; Speedway and Grandstand, Kansas City, Mo., 500 tons, to Kansas City Structural Steel Co. The Santa Fe Railroad is in the market for 300 tons.

Coke.—The price of $11.25 delivered Chicago switching district named on local by-product foundry coke, July 1, will apply on business taken this month only. Because of the uncertainties of the fuel situation, the ovens are not disposed to commit themselves any farther ahead. A Southern by-product plant is offering foundry coke at $10.50 delivered Chicago.

Old Material.—Demand is growing more active and prices have rather generally advanced 25c. to $1 a ton. It is evident that more consumers than had been expected held up buying until the new freight rates became effective. The recent advances in pig iron and the possibility of delayed shipments from blast furnaces if the coal strike continues are also given as reasons for the resumption in buying. In some quarters, the freight rate reduction was expected to result in an easier market because it would release shipments from outlying points. It appears, however, that the increased supply resulting from lower rates as well as from greater scrap production by manufacturing plants is balanced by increased consumption. A local steel works has closed for a round tonnage of heavy melting at a maximum price of $15.50 per ton delivered, and has also made liberal purchases of special grades, including 10,000 tons of low phosphorus heavy melting steel. All of the low phosphorus grades are in greater demand and have advanced proportionately. This material has been low in comparison with the price of low phosphorus pig iron, which is about $40 delivered, Chicago. Iron mill grades are moving in greater volume as bar iron mills increase their production. There is also a widespread demand for cupola and malleable scrap. Railroad offerings include blind lists issued by the Michigan Central and the Big Four.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$18.00 to $18.50
Cast iron car wheels	18.50 to 19.00
Relaying rails	22.50 to 27.50
Rolled or forged steel car wheels	17.50 to 18.00
Steel rails, rerolling	16.00 to 16.50
Steel rails, less than 3 ft	17.00 to 17.50
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Shoveling steel	14.50 to 15.00
Drop forge flashings	10.50 to 11.00
Hydraulic compressed sheet	12.50 to 13.00
Axle turnings	12.50 to 13.00

Per Net Ton

Iron angles and splice bars	16.50 to 17.00
Steel angle bars	14.50 to 15.00
Iron arch bars and transoms	17.00 to 17.50
Iron car axles	22.50 to 23.00
Steel car axles	15.50 to 16.00
No. 1 busheling	11.50 to 12.00
No. 2 busheling	6.75 to 7.25
Cut forge	13.00 to 13.50
Pipes and flues	10.00 to 10.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.50 to 14.00
Steel knuckles and couplers	15.50 to 16.00
Coil springs	16.00 to 16.50
No. 1 machinery cast	17.00 to 17.50
No. 1 railroad cast	16.00 to 16.50
Low phos. punchings	15.00 to 15.50
Locomotive tires, smooth	13.00 to 13.50
Machine shop turnings	8.50 to 9.00
Cast borings	11.00 to 11.50
Stove plate	14.50 to 15.00
Grate bars	13.50 to 14.00
Brake shoes	13.50 to 14.00
Railroad malleable	15.50 to 16.00
Agricultural malleable	15.50 to 16.00

Railroad Equipment Business

Car purchases which came to light for the past week total 5000, a substantial addition was made to the car business under inquiry and activity marked the negotiations in locomotives.

The Western Pacific has ordered 2000 refrigerator cars from the American Car & Foundry Co. The Norfolk & Western will place orders this week for 2000 70-ton steel hopper cars and 1000 box cars.

The Nashville, Chattanooga & St. Louis Railroad has increased the number of cars for which it is inquiring from 750 to 1000, its revised inquiry calling for 750 cars, 150 stock and 100 flat cars. It is also in the market for 17 passenger service cars.

The Chicago Great Western has distributed repairs on 527 box cars as follows: 154 to Sheffield Car & Equipment Co., 173 to Siems-Stembel Co., 200 to Pullman Co.

The Chicago, Milwaukee & St. Paul is inquiring for 700 underframes.

The Pere Marquette is in the market for 1000 box car repairs.

The Chicago & Eastern Illinois is inquiring for 15 baggage cars and the Santa Fe for 8 buffet cars.

The Boston & Maine Railroad has made preliminary plans for the purchase of 22 type 0-8-0 switching locomotives, two type 0-8-8-0 Mallet switching locomotives, 65 steel passenger coaches, 20 steel smoking cars, 8 steel baggage-smoking cars, 5 steel baggage and mail cars and 25 milk cars.

The New York, Chicago & St. Louis has ordered 14 locomotives from the Lima Locomotive Works.

The Southern has bought 15 Mikado type engines from the American Locomotive Co., and is also in the market for 15 Pacific type locomotives.

The Chicago & Eastern Illinois has placed 10 Mikado type engines with the American company and is about to order 6 Pacific type.

The Milwaukee Rolling Mill Co., Milwaukee, manufacturing blue annealed and black sheets, is reported to have under consideration tentative plans for the enlargement of the plant, completed about 18 months ago. This has been in operation 24 hr. a day for nearly a year past. Details of the proposed extensions are not available as yet. Boyd B. Jack is general manager.

New York

Coke Situation More Serious—Some Foreign Pig Iron Coming In

NEW YORK, July 3.

Pig Iron.—The scarcity of high silicon irons is becoming more pronounced, owing to the increased cost of coke and the difficulty of obtaining coke supplies, and one company which is selling on a basis of $25.50 eastern Pennsylvania furnace for No. 2 plain and $26.50 for No. 2 X, would sell No. IX at $27.50, but is not seeking orders in the high silicon irons. During the past week more has been heard in regard to foreign iron. A sale of 100 tons of Scotch was made to an up-State furnace at about $25.50, New York. At Baltimore, 500 tons of Middlesbrough was delivered and about 2000 tons more is on the way, the price being about $24.50, Baltimore. No important sales have been made during the past week and the market has been very quiet. This is attributed to a large extent to the holidays. Alabama iron can be bought at $18.50, Birmingham.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$28.77 to $29.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	27.77 to 28.77
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	26.77 to 27.77
Buffalo, sil. 1.75 to 2.25	28.91 to 29.41
No. 2 Virginia, sil. 1.75 to 2.25	29.44

Ferroalloys.—Demand for ferromanganese has declined. There is some inquiry for August shipment of British alloy, but not much desire on the part of consumers to place orders because of the possible tariff. It is evident that July shipments of the British alloy have been sold up and there is no evidence that consumers are not covered for immediate needs. Quotations are unchanged except for such lots of prompt or July shipments as are available, for which $70, seaboard, is easily obtained. The spiegeleisen market is quiet at unchanged prices and there are no developments in the 50 per cent ferrosilicon or the ferrochromium markets, except that specifications on contracts are heavy. Quotations are as follows:

Ferromanganese, domestic, seaboard, per ton	$67.50
Ferromanganese, British, seaboard, per ton	$67.50
Spiegeleisen, 20 per cent	$36.00
Ferrosilicon, 50 per cent, delivered, per ton	$55.00 to $60.00
Ferrotungsten, per lb. of contained metal	.40c. to 50c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered	.12c. to 14c.
Ferrovanadium, per lb. of contained vanadium	$3.00 to $3.50
Ferrocarbontitanium, 15 to 18 per cent, 1 ton to carloads, per ton	$200.00
Ores	
Manganese ore, foreign, per unit, seaboard	.25c. to 26c.
Tungsten ore, per unit, in 60 per cent concentrates, nominal	$3.00 up
Chrome ore, basis 48 per cent Cr_2O_3, crude, per unit, Atlantic seaboard	.40c. to 45c.
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	.40c. to 45c.

Finished Iron and Steel.—Bids submitted to the New York Central Railroad last week on 3000 tons of plates, shapes and bars for its third quarter requirements probably indicate the minimum at which the various bidders are now willing to accept business even from such a preferential customer as a large railroad system. The Carnegie Steel Co. bid 1.705c., base Youngstown, on all three items; the Illinois Steel Co. bid 1.755c., Chicago; the Inland Steel Co., 2c., mill, on plates and shapes. The Lackawanna Steel Co. bid 1.86c., West Seneca, N. Y., equivalent to 1.80c. at its mill; the Bethlehem Steel Co.'s bid was 2.02c., base, delivered at Newberry Junction, Pa., for all three items. Bids were also submitted on wire nails and staples, billets, axles and tires. The Cambria Steel Co.'s bid of 2.50c. per lb. base, Pittsburgh, on wire nails was the highest. The Jones & Laughlin Steel Co. bid 2.40c., Youngstown, while the American Steel & Wire Co. bid 2.40c., Farrell, Pa., or Cleveland. The Pittsburgh Steel Co.'s price was 2.502c., Youngstown. On billets, forging quality, the Cambria Steel Co. quoted $40, Pittsburgh; Donner Steel Co., $41, Buffalo; Lackawanna Steel Co., $40, West Seneca, N. Y., and Wheeling Steel Products Co., $39, Portsmouth, Ohio, all of which were base prices to which usual extras were added. On tires there were two bids of 5c. per lb., one for delivery at Newberry Junction, Pa., and the other f.o.b. Youngstown, while 5.20c. per lb., Pittsburgh, and 5.65c. per lb., Youngstown, were also bid. Fresh developments in the local steel market during the past week have been few, the three-day holiday, which was quite generally observed, having tended to hold back business. At least the holiday was credited as partly the cause for the quiet condition of the market, though there has been little business of any important character for the past two weeks. The uncertainty due to the coal and coke situation, on top of which now comes the strike of railroad shopmen, has apparently placed consumers in a quandary as to what buying policy to pursue. Indications are that most of them have decided to buy very cautiously for the present. Prices are strong, several companies now quoting 1.80c., Pittsburgh, on plates, shapes and bars, though purchases are being made at $2 a ton under these prices. Only in cases where buyers are willing to pay a premium for prompt delivery or where the tonnages are small has 1.80c. been obtained. One Eastern plate mill has advanced from 1.60c. to 1.70c. and an Eastern mill rolling shapes has made the same advance. An outstanding inquiry is for 7500 tons of semi-finished steel from a Buffalo maker of bolts, nuts and rivets.

We quote for mill shipments, New York, as follows: Soft steel bars and structural shapes, 2.04c.; bar iron, 1.94c., and steel plates, 1.94c. to 2.04c. On export shipments the freight rate from Pittsburgh to New York is 28.5c. per 100 lb., while the domestic rate is 34c.

High Speed Steel.—The market shows a distinct improvement, but buying is still from hand to mouth. Lumping sales of high speed and high carbon steels together June has been as satisfactory a month as any this year with most producers. The market is unchanged at about 75c. per lb. for 18 per cent tungsten high speed steel with special brands of some companies bringing up to 95c. per lb.

Cast-Iron Pipe.—Foundries in this district are unable to make better than two to three months deliveries. The demand is heavy from private sources for all sizes of pipe, but the scarcity is particularly severe in the smaller sizes, ranging from 6-in. to 12-in. Increased cost of coke and pig iron has caused makers in this district to advance prices $2.50 per ton. The Department of Water Supply, Gas & Electricity, New York, will open bids July 8, on 6100 tons of 6-in., 8-in., 12-in. and 20-in. pipe. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $53.30; 4-in. and 5-in., $58.00; 3-in., $68.30, with $4 additional for Class A and gas pipe.

Warehouse Business.—With the exception of black and galvanized sheets, prices are exceedingly stiff and there is a feeling that an upward revision may be made within the next ten days or two weeks. Despite strong efforts on the part of many warehouses to hold prices on black and galvanized sheets to the established schedule of 4.35c. and 5.35c. per lb., respectively, shading is prevalent and sellers in New York are reported to have quoted as low as 4c. and 5c. per lb. delivered to consumers through Connecticut or about 3.90c. and 4.90c. per lb. base, New York on black and galvanized. June is generally conceded to have been the best month this year by iron and steel warehouses, dealers in wrought iron and steel pipe and others. The brass and copper warehouses also report an improvement for June, despite a decided decline in business during the past two weeks. We quote prices on page 68.

Coke.—Preceding the holidays, beginning last Saturday, the coke market was very active, as consumers, fearing a reduction in output on account of the holidays, were pressing for deliveries and were trying to make purchases. It was, however, very difficult to obtain high grade coke and both furnace and foundry grades were quoted at $8.50 to $9.50, while the price of by-product was advanced 50c. to $10.50 and was being sold only to regular customers. Conditions were not improved early this week.

Old Material.—Prices are firmer and considering the holidays the market has been fairly active. Wierton, Monessen, Jones & Laughlin, Alan Wood and Bethlehem are buying. Cast scrap is strong. Stove plate is now quotable up to $10.50 to $11.00 per ton. The acute shortage of scrap of all kinds in Europe may lead to purchase in this market eventually. One buying office

of a German interest is reported to have offered up to as high as $12.00 per ton, f.a.s. New York, but unsuccessfully, while inquiries have been received from Italy offering $14.00 per ton, c.i.f. Italian port.

Buying prices per gross ton, New Yoork, follow:

Heavy melting steel, yard	$9.50 to $10.00
Steel rails, short lengths, or equivalent	11.00 to 11.50
Rerolling rails	11.00 to 11.50
Relaying rails, nominal	27.00 to 28.00
Steel car axles	16.00 to 17.00
Iron car axles	22.00 to 23.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track	11.00 to 11.50
Forge fire	8.00 to 8.50
No. 1 yard wrought, long	10.50 to 11.00
Cast borings (clean)	9.00 to 10.00
Machine-shop turnings	9.00 to 10.00
Mixed borings and turnings	9.00 to 10.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	10.50 to 11.00
Locomotive grate bars	11.50 to 12.00
Malleable cast (railroad)	10.00 to 10.50
Cast-iron car wheels	13.00 to 13.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$18.00 to $19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	16.50 to 17.00
No. 1 heavy cast, not cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Boston

BOSTON, July 3.

Pig Iron.—Sales of domestic iron the past week were confined to car lots of Buffalo at $25, furnace base, eastern Pennsylvania at $25 and $26 base, western Pennsylvania at $26 base, Virginia at $25 base, and Alabama at $18.50 base. The aggregate tonnage is unimportant. Buffalo iron at $23 is a thing of the past, while a northwestern Pennsylvania furnace with a freight of $6.58, advanced its price from $23 to $24 base and withdrew from the market. Eastern Pennsylvania furnaces quite generally are making $1 differentials in silicons. The domestic iron situation, barring Alabama, therefore is stronger, although not active. Brokers show considerable and the foundry trade little interest in foreign irons. A Taunton, Mass., stove maker bought 500 tons of Scotch iron equivalent to our No. IX at a price well below those quoted on domestic grades, but no other sales were reported for the past week. One steamer brought in 1000 tons of Scotch iron "to order" the past week as reported in THE IRON AGE and 500 tons consigned to Philadelphia. Scotch, silicon 2 to 2.75, is offered at about $26 to $26.50 landed Boston; English, silicon 2 to 2.50, at about $26; and French, silicon 2.50 to 3.50 at about $22.50 to $23. The only inquiry in the market of any size is one for 500 tons No. IX, third quarter delivery, from a Connecticut foundry.

We quote delivered at common New England points as follows, having added to furnace prices $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$29.15 to $30.65
East. Penn., sil. 1.75 to 2.25	28.65 to 29.65
Buffalo, sil. 2.25 to 2.75	30.41
Buffalo, sil. 1.75 to 2.25	29.91
Virginia, sil. 2.25 to 2.75	31.42
Virginia, sil. 1.75 to 2.25	30.92
Alabama, sil. 2.25 to 2.75	28.60 to 30.10
Alabama, sil. 1.75 to 2.25	28.10 to 29.60

Warehouse Business.—Early in the week the movement of iron and steel out of Boston stocks was fairly brisk, but business tapered off in the last few days, presumably because a very large percentage of the New England metal working plants were closed from Saturday to July 5. Notwithstanding the reduction in freight rates, there is common talk of still higher prices on bars, shapes, plates and sheets within the near future. Buying of bolts and nuts is on a fairly satisfactory scale, while wire products, aside from nails, have little call. Horseshoes are selling better than they were a month back.

Jobbers quote: Soft steel bars, $2.60½ per 100 lb. base; flats, $3.25½; concrete bars, $2.75 to $2.88; structural steel, $2.60½ to $2.70½; tire steel, $4 to $4.35; open-hearth spring steel, $4.50 to $6; crucible spring steel, $11.50; steel bands, $3.50; hoop steel, $4; cold rolled steel, $3.30 to $3.80; refined iron, $2.60½; best refined iron, $4.25; Wayne iron, $5.50; Norway iron, $6 to $6.50; plates, $2.70½ to $2.87½; No. 10 blue annealed sheets, $3.40½ to $3.63 per 100 lb. base; No. 28 black sheets, $4.90; No. 28 galvanized sheets, $5.90.

Coke.—Both the New England Coal & Coke Co., Boston, and the Providence Gas Co., Providence, R. I., have announced a further advance in prices on by-product foundry coke. This time spot fuel is advanced from $13 to $14.50, and contract from $12 to $13.50, delivered. The Boston concern also advanced its price on foundry coke to be delivered outside New England from $10 to $12, ovens. Both producers are now out of the market on contract coke, but previous to this announcement the New England Coal & Coke Co. booked a considerable tonnage for last half delivery at prices ruling date of shipment. Its decision to withdraw from the contract market is based on the uncertainty of the transportation and coal situation, and not because the capacity of ovens has been reached. Against the further advance in fuel is a reduction in the freight rate allowed on delivered prices. Heretofore delivered prices involved freight not exceeding $3.40 a ton. Today the allowance is $3.10, a reduction of a little less than 10 per cent.

Old Material.—A fairly good business in mixed borings and turnings for shipment to eastern Pennsylvania mills was put through by brokers the past week. In a few instances $8.75 f.o.b. shipping point was paid for shoveling material, but where bushings are involved, dealers will not pay more than $8 or $8.10. A few car lots of bundled skeleton were purchased by eastern Pennsylvania mills, while cotton ties were taken for New England delivery at $7.10 shipping point. Stove plate is quoted at 50c. a ton higher, but comparatively little is moving. Heavy melting steel is sentimentally firmer, but consumers have continued to hold off pending a reduction in freights. Most of the new business put through recently was made on contracts which provided for the buyer securing the benefit of reduced freights. Rates on scrap to Lebanon, Pa., are now $4.41, contrasted with $4.90 heretofore; to Johnstown, Pa., $5.25½, as against $5.84; to West Virginia points $5.52½, compared with $6.14 heretofore, and to other points proportionately lower. Delivered prices on machinery cast, insofar as applied to New England points, apparently have not been influenced by the reduction in freight rates.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$19.00 to $20.00
No. 2 machinery cast	17.00 to 18.00
Stove plate	14.00 to 14.50
Railroad malleable	15.00 to 15.50
Street car wheels	18.00 to 19.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$10.50 to $11.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 yard wrought	10.00 to 10.50
Wrought pipe (1 in. in diam., over 2 ft. long)	8.00 to 8.50
Machine shop turnings	8.00 to 8.50
Cast iron borings, rolling mill	8.50 to 9.00
Cast iron borings, chemical	10.50 to 11.00
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap and bundled skeleton	8.00 to 8.50
Street car axles and shafting	14.50 to 15.00
Rerolling rails	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., July 3.

Pig Iron.—Following booking of about 40,000 tons for the leading pipe interests by two or three makers and acknowledged bookings of 50,000 tons in June by the Sloss-Sheffield Steel & Iron Co., July entered under an apparently strong head toward $20 iron all around. The lion's share of the June business, it is admitted, was done on the $18.50 base, but the makers holding for $20 also made bookings of considerable tonnage over a scattered territory. Philadelphia took two lots of 100 and 500 tons at $20. A disconcerting factor was the quotation of $18, Birmingham base, by a Tennessee furnace just resuming and desirous of tonnage. An interesting sale was 3000 tons in Boston territory at base of $18.50 and $19. The mass of June business was done in St. Louis and Chicago territory, rail and water, iron from northern Alabama being conspicuous. The Tennessee company resumed at No. 1 furnace in Bessemer on foundry last week, but will change to ferromanganese on arrival of Brazilian ore now on the way up the Warrior River and will probably operate on ferromanganese until the 30,000 tons of ore are converted. The Republic Iron & Steel Co. is getting its third stack at Thomas in Birmingham prepared to operate. It is

thought it may go in about July 15. The stack of Central Coal & Iron Co. at Holt will be ready to resume toward the end of the month. On July 1 there were 21 active stacks in Alabama, 13 on foundry and 8 on basic.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$18.50 to $20.00
Basic	18.50 to 19.50
Charcoal, warm blast	30.00 to 32.00

Finishing Mills.—Steel works will resume July 5 the Tennessee company continuing double turn at practically all mills with 100 per cent ingot production. The Gulf States Steel Co., American Steel & Wire Co., Conners Steel Co. and structural steel works are on or near full turn. Shipments out of Mobile last week included 200 tons of steel hoops and 250 tons of fence wire for Buenos Aires, 100 tons of fence wire for Montevideo and 50 tons of fence wire for Neuvitas, Cuba. Northern mills are not accepting new business in sheets and pipe.

Cast Iron Pipe.—Belated brokers have offered $60 and $65 for prompt shipment of sanitary pipe and some bookings have been made at these prices. Larger makers say their base is still $55. Shops are on full turn. Ten per cent wage advances have been made. Pressure pipe bookings include 400 tons of universal pipe for Detroit by the Central Foundry Co. and numbers of orders from southwestern points by Birmingham shops. Delivery is the burning question. Base is firm at $37.

Coal and Coke.—Coal production week ending June 24 was 360,000 tons, largest in five years. All mines are on full turn. Extra business incident to strike is from 65,000 to 80,000 tons a week. Base is $2.25 to $2.50 Pratt seam for spot deliveries. Iron Mountain and Rock Island have entered the market. Coke is firm at $5.50 to $6. Sloss-Sheffield Steel & Iron Co. is reducing the coke pile at its by-product plant at the rate of 1000 tons a day.

Old Material.—The scrap market is stronger than in several months and stocks on yards have been depleted. Cast scrap is now bringing $15 to $16.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	$13.00 to $15.00
No. 1 steel	12.00 to 14.00
No. 1 cast	15.00 to 16.00
Car wheels	14.00 to 15.00
Tramcar wheels	13.00 to 14.00
Stove plate	13.00 to 14.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	4.00 to 5.00

Buffalo

BUFFALO, July 3.

Pig Iron.—While No. 2 plain iron can still be purchased for $24 in some quarters, there is a stiffening apparent and $25 has been the consideration in several transactions. Only one seller has booked any considerable tonnage and 5000 tons of new business represents the total volume by this interest for the week. M. A. Hanna & Co., who operate the Buffalo Union Furnace Co., have put another furnace in blast. Inquiry has been good with all the selling factors and with several the situation is that they cannot consider third quarter business because of the amount of tonnage booked and are not ready to commit themselves on fourth quarter requests. There is no change in the fuel situation but July operation is assured on the same basis as has existed since the inception of the strike.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$25.00
No. 2X foundry, 2.25 to 2.75 sil.	24.50
No. 2 plain, 1.75 to 2.25 sil.	24.00
Basic	24.00
Malleable	24.50
Lake Superior charcoal	31.78

Warehouse Business.—Sheets are in better demand than other products and this is assumed to be due to the stringency with the mills. Prices on bolts have been advanced by mills, but the raise has not been passed along by warehouses as yet. No rush of orders appeared on account of the railroad labor unrest—a direct contrast to the situation at the time of the last threatened trouble.

Finished Iron and Steel.—None of the local selling agencies is in any better position in the matter of accepting business. One steel interest, manufacturing a line of specialties and which has its full complement of open hearths in operation, is able to use more steel than it produces and is in the market for billets. Some of the sellers report a heavier demand on bars, but the leaders in the selling field in this product are entirely unable to take the business. One agency is able to take only certain sizes in plates—⅜ in. and heavier and shapes only where rolling schedules permit. Tin plate is quiet and buyers are between seasons. An independent interest is taking orders on black sheets freely, but unable to consider offers of tonnage in galvanized or blue annealed. An inquiry for 8000 tons of plates, 1400 tons of shapes and 600 tons of bars is expected in the market if the efforts of a car company are successful in obtaining a contract for the repair of D., L. & W. cars. The Buffalo Structural Steel Co. is low bidder on 350 tons of shapes on the new Hurst Building, Buffalo, but the contract has not been let.

We quote warehouse prices, f.o.b. Buffalo, as follows: Structural shapes, 2.65c.; plates, 2.65c.; soft steel bars, 2.55c.; hoops, 3.30c.; bands, 3.15c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.40c.; black sheets, No. 28, 4.40c.; cold-rolled strip steel, 6.05c.; cold-rolled round shafting, 3.35c.

Old Material.—Mills are showing more interest and there is a tendency on the part of dealers to hold heavy melting steel for better prices. Demand from outside the district for cast iron borings and car wheels has stiffened prices on those products.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel	$16.75 to $17.00
Low phos., 0.04 and under	18.00 to 19.00
No. 1 railroad wrought	16.00 to 16.50
Car wheels	17.00 to 18.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	12.50 to 13.00
Heavy axle turnings	14.00 to 14.50
Grate bars	14.00 to 14.50
No. 1 busheling	15.00 to 15.50
Stove plate	15.00 to 15.50
Bundled sheet stampings	11.50 to 12.00
No. 1 machinery cast	18.00 to 18.50
Hydraulic compressed	15.00 to 15.50
Railroad malleable	17.00 to 17.50

St. Louis

ST. LOUIS, July 3.

Pig Iron.—The market for pig iron continues strong with prices unchanged for either Northern or Southern makes. Buying, however, has not been so heavy, the only sales of consequence being made by a Sheffield producer, whose quotation of $18.50 Birmingham, while other makers of Southern iron are quoting up to $20, Birmingham, is the attraction, indicating that price is considerable of a factor. The Sheffield maker's sales amounted to 2500 tons, which was in lots of from 35 to 200 tons, mostly to stove manufacturers. The St. Louis Federal Reserve Bank report shows that the melt of pig iron and scrap in the district increased approximately 8¾ per cent in May over the April level. The St. Louis bank review also states that seven leading stove manufacturers report sales in May 10 per cent to 115 per cent larger than for May, 1921, and 10 to 60 per cent more than in April, 1922. Five farm implement manufacturers and distributors reported to the bank that their May sales were from 6 to 82½ per cent larger than in April.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago and $5.17 from Birmingham and 81 cents average switching charge from Granite City:

Northern foundry, sil. 1.75 to 2.25 (third quar.)	$26.56
Northern malleable, sil. 1.75 to 2.25 (third quar.)	26.56
Basic (third quar.)	26.56
Southern foundry, all rail, sil. 1.75 to 2.25	$23.67 to 24.67
Southern foundry, water and rail, sil. 1.75 to 2.25, f.o.b. St. Louis	22.74

Finished Iron and Steel.—Structural steel fabricators report specifications received in May the heaviest in any month, the reports of the St. Louis Federal Reserve Bank say. June business continues also to be

good, although St. Louis contracts are for the most part small ones. Fabricators, however, continue to buy on a more or less hand to mouth basis, and have not yet begun to consider their fall requirements. Mills are well sold up, and the coal strike adds to the difficulties of placing business. James Stewart & Co. are the lowest bidders on the contract for the Government hospital to be built at Jefferson Barracks, involving about 400 tons of reinforcing bars, and a small amount of structural steel.

For stock out of warehouse we quote: Soft steel bars, 2.57½c. per lb.; iron bars, 2.57½c.; structural shapes, 2.67½c.; tank plates, 2.67½c.; No. 10 blue annealed sheets, 3.72½c.; No. 28 black sheets, cold rolled, one pass, 4.45c.; cold drawn rounds, shafting and screw stock, 3.50c.; structural rivets, $3.19½ per 100 lb.; boiler rivets, $3.29½; tank rivets, 7/16 in. and smaller, 60 per cent off list; machine bolts, large, 50 and 10 per cent; small, 50-10 and 10 per cent; carriage bolts, large, 55-5 per cent; small, 60 and 10 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, $3.50; and tapped, $3.25 off list.

Coke.—The substitution of coke for coal increases as the coal strike continues. Buying has been heavy, and it is expected that there will be considerable additional business placed with the decline in freight rates. The market for Connellsville coke is at $8.00 to $8.25.

Old Material.—The market for old material continues firm. Buyers are expected to enter the market as soon as the railroad situation improves. Special steel grades are strong, and large short interests exist in these grades. Melting rails and foundry grades are in good demand. Rolling mill and ordinary steel grades are quiet.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Old iron rails	$16.75 to $17.25
Steel rails, rerolling	14.25 to 14.75
Steel rails, less than 3 ft	15.00 to 15.50
Relaying rails, standard section	25.00 to 28.00
Cast iron car wheels	18.25 to 18.75
No. 1 heavy railroad melting steel	14.00 to 14.50
No. 1 heavy shoveling steel	13.00 to 13.50
Ordinary shoveling steel	12.50 to 13.00
Frogs, switches and guards, cut apart	14.00 to 14.50

Per Net Ton

Heavy axle and tire turnings	9.50 to 10.00
Steel angle bars	13.00 to 13.50
Iron car axles	23.00 to 23.50
Steel car axles	17.00 to 17.50
Wrought iron bars and transoms	18.50 to 19.00
No. 1 railroad wrought	12.75 to 13.00
No. 2 railroad wrought	11.75 to 12.25
Railroad springs	15.25 to 15.75
Steel couplers and knucklers	15.25 to 15.75
Cast iron borings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad cast	11.50 to 16.00
Stove plate and light cast	12.75 to 13.25
Railroad malleable	12.50 to 13.00
Pipe and flues	7.75 to 8.25
Machine shop turnings	8.50 to 9.00

Philadelphia

Quiet Week Due Largely to Strike Uncertainties—Costs Advancing

PHILADELPHIA, July 3.

Facing costs which will be higher in July than they were in June, steel and pig iron producers are making every effort to obtain a sufficient price to minimize losses or eke out a small profit. Despite the large volume of business during the past two or three months, some of the independent steel companies have not shown a profit on the first half's operation, nor even on the past two months. One independent company in figuring its July costs found that out of about 60 items of all kinds bought for its blast furnaces, only three or four had not advanced in price within the past month. Mounting fuel costs are the largest single element in iron and steel manufacture, coke costing about $11 a ton at eastern furnaces, or about $13.75 per ton of foundry iron. Based on to-day's prices, foundry pig iron is costing as high as $26 a ton to produce at some eastern Pennsylvania furnaces and even under the most favorable operating and raw material conditions, it is asserted that this manufacturing cost will not be shaded very much during July unless a settlement of the coal strike should bring lower fuel costs. Blast furnaces are still shipping $19 and $20 iron, which brings their average down and adds to their losses.

In both the steel and pig iron trade, the past week has been marked by extreme quiet, a situation due in part to the holidays, but more largely to the increased uncertainty with regard to the coal and railroad strikes. Sellers are quite as anxious to be cautious in selling as buyers are in buying. Resumption of active buying is not looked for until the strike clouds have cleared away, permitting the trade generally to plan for the future with more assurance.

Pig Iron.—Another quiet week in the eastern pig iron trade has brought no material change in the situation, which, as it stands, leaves both producers and consumers without reliable guidance in planning for the future. A great deal of third quarter buying, it is known, must still be done, but consumers apparently prefer to worry along with the iron they already have in sight, picking up spot carloads when necessary, rather than try to anticipate what may happen when the coal and railroad strikes shall have been settled. Pig iron costs are mounting, as referred to in a paragraph above, which induces conservatism in selling as well as in buying. Domestic producers of iron are not anxious to see prices go higher, as they fear further importation of foreign iron, which already is largely dominating the spot market. Nearly all of the local merchants in seeking supplies to meet urgent requirements of their customers have bought some foreign iron because furnaces here are unwilling to accept their orders. The cheapest iron being offered is from France at $23 a ton, f.o.b. cars, Philadelphia, for a grade closely approximating eastern Pennsylvania No. 2X except that the phosphorus runs as high as 1.75 per cent. Not all buyers are satisfied to use the foreign iron, however, and they are offering as high as $28 and $30, furnace, for domestic No. 2X. The scarcity of foundry iron may shortly be accentuated by buying of basic by eastern steel companies. One company has bought about 1500 tons at $26.75, delivered, and is seeking a few thousand tons more, while an eastern plate manufacturer is seeking a tonnage for shipment this month. The American Bridge Co. has bought 10,000 to 12,000 tons of basic for August-September shipment, but the price reported to have been paid is about $2 a ton less than eastern furnaces are apparently willing to do, which leads the local trade to assume that the order was placed with another Steel Corporation subsidiary. Local furnaces are quoting basic at $25, furnace, but on the 1500-ton sale referred to the furnace price was slightly above $25. A sale of 3000 tons of gray forge at about $25.50, delivered, has been made. The only important inquiry for foundry iron is from the National Radiator Co., which wants 1000 tons for its Trenton, N. J., and Johnstown, Pa., plants. The prices printed below are slightly lower than last week's quotations, due to the reduction in freight rates.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 76 cents to $1.64 per gross ton:

East Pa. No. 2 plain, 1.75 to 2.25 sil.	$26.64 to $27.26
East. Pa. No. 2X, 2.25 to 2.75	27.64 to 28.26
East. Pa. No. 1X	28.64 to 29.76
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 31.17
Basic delivery eastern Pa.	25.75 to 26.75
Gray forge	25.50 to 26.00
Malleable	27.50 to 28.00
Standard low phos. (f.o.b. furnace)	30.00
Copper bearing low phos. (f.o.b. furnace)	30.00

Ferroalloys.—The situation in ferromanganese has not changed within the past week. The quotation of both British and domestic producers is $67.50, Atlantic seaboard. Spiegeleisen is quoted at $36, furnace.

Semi-Finished Steel.—There is considerable divergence in prices for forging billets. One mill is quoting $38 to $40, Pittsburgh, while another has been paid $40 to $45, Pittsburgh. Sales of 500 tons at $40, 500 tons at $42.50 and a carload at $45, all base Pittsburgh, are reported by one maker. Rerolling billets are uniformly quoted at $35, Pittsburgh. The new rate on semi-finished steel from Pittsburgh to Philadelphia is $5.17 per gross ton.

Plates.—One Eastern company which has been selling plates at 1.60c., Pittsburgh, has advanced its price to 1.70c., while two or three others are now quoting 1.80c. One effect of the stronger situation in plates is to advance the base prices at which the lighter gages are quoted. Until recently sizes under 3/16 in. were sold on the ordinary tank steel base, but now there are special base prices, with usual extras, for lighter gages up to 2c. per lb., base, for No. 8 gage. A contract for 1000 tons of light plates for third quarter at 1.95c., Pittsburgh, is reported by one Eastern maker, while on 300 tons for prompt shipment the price was 2.05c., mill. The Pennsylvania Railroad will inquire probably this week for 5000 to 10,000 tons of car repair plates. Bids close July 5 on 3000 tons of plates, shapes and bars for the Norfolk & Western Railroad. We quote ¼ in. and heavier at 1.70c. to 1.80c., Pittsburgh, to which is added the new freight rate of 32½c. per 100 lb. to Philadelphia and 31½c. to Baltimore.

Structural Material.—An advance in its price from 1.60c. to 1.70c., Pittsburgh, on structural shapes by an Eastern mill places this market firmly upon the 1.70c. level, while some mills are asking 1.80c., Pittsburgh. One mill is restricting its orders only to those specifications which can be gotten out economically. We quote plain material at 1.70c. to 1.80c., Pittsburgh. The new freight rate on finished material to Philadelphia is 32½c. per 100 lb. and 31½c. to Baltimore.

Bars.—The price situation on steel bars continues stronger than that of plates and shapes and 1.80c., Pittsburgh, is more nearly the price which consumers must now pay for early shipment, though 1.70c. still obtains on considerable business where mills cannot do better than six or eight weeks. Bar iron prices are unchanged by Eastern makers at 1.60c., Pittsburgh, for carloads and 1.70c. for less than carloads.

Sheets.—Most of the mills have now covered their regular customers for all of third quarter at 2.40c. for blue annealed, 3.15c. for black and 4.15c. for galvanized, base Pittsburgh, and prices asked for prompt shipment are uniformly higher, varying from $2 to $5 a ton.

Bolts, Nuts and Rivets.—During the week or two prior to the end of second quarter users of bolts, nuts and rivets have specified very heavily on their contracts, in some instances buyers specified more than their contracts called for. Third quarter prices are considerably above those ruling on second quarter contracts.

Warehouse Business.—The demand for steel out of stock continues fairly active, buyers usually complaining that they are not getting shipments as expected from the mills. Prices are unchanged, but there will probably be slight readjustments to meet the reduction in freight rates. We quote for Philadelphia delivery as follows:

Soft steel bars and small shapes, 2.56c.; iron bars (except bands), 2.56c.; round edge iron, 2.75c; round edge steel, iron finish, 1½ x ½ in., 2.75c.; round edge steel planished, 3.50c.; tank steel plates, ¼-in. and heavier, 2.66c.; tank steel plates, 3/16-in., 2.85c.; blue annealed steel sheets, No. 10 gage, 3.40c.; black sheets, No. 28 gage, 4.25c.; galvanized sheets, No. 28 gage, 5.25c.; square twisted and deformed steel bars, 2.65c.; structural shapes, 2.66c.; diamond pattern plates, ¼-in., 4.35c.; 3/16-in., 4.50c.; spring steel, 3.50c.; round cold-rolled steel, 3.20c.; squares and hexagons, cold-rolled steel, 3.70c.; steel hoops, No. 13 gage and lighter, 3.35c.; steel bands, No. 12 gage to 3/16-in., inclusive, 3.21c.; iron bands, 3.90c.; rails, 2.36c.; tool steel, 8c.; Norway iron, 5.50c.; toe calk steel, 4.50c.; tire steel, 2.65c.; planished tire steel, 3.40c.

Old Material.—Although the Pittsburgh market is strong on some grades, weakness has appeared in Eastern scrap prices within the past few days. There are more sellers than buyers and this situation, as usual, has resulted in concessions on certain grades, the most marked of which is on No. 1 cast, of which 500 tons has been sold at $17.50, delivered to a nearby cast iron pipe foundry, a reduction of $1.50 a ton from our last week's quotation. We note a sale of 200 tons of heavy breakable cast at $18, delivered. Borings and turnings and pipe are off about 50c. a ton. Cast iron borings are reported to have been sold at $16, Pittsburgh, and No. 1 cast at $20 to $21. Users of scrap have apparently expected that they would derive the benefit from freight rate reductions, but dealers say that this advantage will go to the shipper and not to the consumer. We quote for delivery at consuming points in this district as follows:

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Scrap rails	15.00 to 15.50
Steel rails, rerolling	17.00 to 17.50
No. 1 low phos., heavy 0.04 and under	22.00 to 24.00
Cast iron car wheels	17.50 to 18.50
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.00 to 15.50
No. 1 forge fire	13.00 to 13.50
Bundled sheets (for steel works)	13.50 to 14.00
No. 1 busheling	15.00 to 15.50
No. 2 busheling	12.00 to 13.00
Turnings (short shoveling grade for blast furnace use)	13.00 to 13.50
Mixed borings and turnings (for blast furnace use)	13.00 to 13.50
Machine-shop turnings (for steel works use)	13.00 to 13.50
Machine-shop turnings (for rolling mill use)	13.50 to 14.00
Heavy axle turnings (or equivalent)	13.50 to 14.00
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	16.50 to 17.50
No. 1 cast	17.50 to 18.50
Railroad grate bars	14.50 to 15.00
Stove plate (for steel plant use)	15.00 to 15.50
Railroad malleable	15.00 to 15.50
Wrought iron and soft steel pipes and tubes (new specifications)	13.50 to 14.00
Shafting	20.00 to 20.50

Cleveland

Ore Shipments by Lake Heavy—Pig Iron Fairly Active

Iron Ore.—Activity in the ore market has subsided somewhat, although a few sales were made during the week in lots of 25,000 tons and under and some new inquiry came out. Several of the round lot inquiries that have been noted are still pending. In some cases, the fuel situation is causing delay in placing orders. If lack of coke prevents operations, furnaces will not want the ore. Lake shipments are now heavy. The June movement was 6,629,711 gross tons as compared with 3,600,189 tons during June of last year. Shipments up to July 1 were 8,351,177 tons as compared with 6,371,227 tons during the corresponding period a year ago.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $5.95; Old range non-Bessemer, 51½ per cent iron, $5.20; Mesabi Bessemer, 55 per cent iron, $5.70; Mesabi non-Bessemer, 51½ per cent iron, $5.05.

Pig Iron.—While sales have fallen off somewhat, the market continues fairly active in small lot orders. Prices on foundry iron shows a stiffening tendency, as some of the lake furnaces are trying to get 50c. more or $23.50. The market is generally represented by a spread of $23 to $23.50, although one Cleveland seller has taken some outside business at $24. For Cleveland delivery 400 tons was sold at $24.50, although $24 has been the usual quotation. The most active seller booked about 10,000 tons during the week. Sales include 1500 tons of malleable iron to a Michigan melter and the following foundry iron orders: Five hundred tons to an Ohio jobbing foundry; 400 tons to an Indiana implement manufacturer; 400 tons to an Indiana automobile foundry; 500 tons to a Michigan automobile foundry, and 600 tons to a northern Ohio machine tool manufacturer. The N. & G. Taylor Co. is inquiring for 5000 tons of basic iron. A New York implement manufacturer is inquiring for 1200 tons of malleable and 800 tons of foundry iron and a Muncie, Ind., foundry for 1200 to 1500 tons of malleable iron. Small lot sales of Southern iron are being made at $18.50, there being no report of the appearance of $18 iron in this market. Prices on low phosphorus iron are slightly easier, especially for shipment to points outside of the sellers' immediate territory. The sale of 500 tons of copper bearing iron to a southern Ohio consumer is reported at $28, or $2 a ton below the regular quotation. It is reported that English low phosphorus iron is being offered in New York at $31. Under new freight rates the Birmingham rate on Southern pig iron is reduced from $6.67 to $6 for shipment to Cleveland and other northern Ohio points, including Akron, Canton, Massillon and Mansfield. The rate on Ohio

silvery iron from the Jackson district has been reduced from $3.36 to $3.02 and the local switching charge in Cleveland from 56c. to 50c. Freight rate changes and price changes due to revised freight rates are shown below.

Quotations below are f.o.b. local furnace for Northern foundry iron, not including a 50c. switching charge. Other quotations except basic and low phosphorus are delivered Cleveland, being based on a $3.02 rate from Jackson and a $6 rate from Birmingham:

Basic, Valley furnace	$25.00
Northern No. 2 fdy., sil. 1.75 to 2.25	$23.00 to 24.00
Southern fdy., sil. 1.75 to 2.25	24.50
Ohio silvery, sil. 8 per cent	33.52
Standard low phos., Valley furnace	33.00 to 34.00

Ferroalloys.—English ferromanganese for July shipment is being offered at $70, an advance of $2.50, the price evidently being marked up because buyers are assured delivery before a tariff advance.

Finished Material.—The market continues fairly active and prices still show an upward tendency. On structural material and plates, 1.70c. apparently is now the minimum quotation. On steel bars the 1.60c. price has not entirely disappeared. A Buffalo district mill has advanced its price $2 a ton on steel bars and structural material to 1.80c. for the former and 1.90c. for the latter. Quotations on heavy plates range up to 2c. and on the light plates up to 2.10c. Automobile and parts manufacturers continue to buy steel, although delivery on some of the orders now being placed cannot be made before about Nov. 15. Reeves Brothers, Alliance, Ohio, have taken oil tanks for the Magnolia Refining Co. requiring 1200 tons of plates which will be furnished by the Midvale Steel & Ordnance Co. The Lima Locomotive Corporation has taken 14 locomotives for the Nickel Plate Railroad. The Community Traction Co., Toledo, has placed 500 tons of steel rails with the Lackawanna Steel Co. Independent mills have made the 2½c. price reduction on fence. In the structural field a large amount of work continues to come out.

Sheets.—Consumers are crowding the mills for deliveries and some orders are being booked for September shipment at 2.60c. for blue annealed, 3.40c. for black and 4.40c. for galvanized.

Warehouse Business.—The demand continues heavy. So far the reduction in freight rates has not resulted in any reductions in warehouse prices.

Jobbers quote steel bars, 2.41c.; plates and structural shapes, 2.51c.; No. 9 galvanized wire, 3c.; No. 9 annealed wire, 2.50c.; No. 28 black sheets, 3.90c. to 4c.; No. 28 galvanized sheets, 4.90c. to 5c.; No. 10 blue annealed sheets, 3.25c. to 3.46c.; hoops and bands, 3.06c.; cold-rolled rounds, 3.20c.; flats, squares and hexagons, 3.70c.

Reinforcing Bars.—Prices are firm at 1.70c. Buffalo has taken bids for a filtration plant requiring 3500 tons. The Franklin Steel Works has taken 400 tons for a warehouse for the Hardware & Supply Co., Akron. The American Construction Co. is low bidder for the general contract for a highway bridge at Schenectady, N. Y., requiring 1000 tons. The Central States Engineering & Construction Co., Cleveland, is low bidder for the West Seventy-third Street Bridge, Cleveland, requiring 270 tons.

Bolts, Nuts and Rivets.—Bolt and nut specifications have been very heavy, consumers taking the full amount due on low-priced contracts that expired July 1. Considerable new business is pending. Many rivet contracts are being closed for the third quarter at regular prices, although there are occasional reports of concessions.

Semi-finished Steel.—A local mill during the week sold several lots of sheet bars, billets and slabs aggregating 5000 tons at $35, Cleveland. A northern Ohio drop forge shop is inquiring for 2000 tons of forging billets. Small lot sales are reported at $42, Pittsburgh.

Coke.—With the withdrawal of one producer there is almost no Connellsville foundry coke being offered in this market. Wise County coke is available at $7 to $7.50. The demand has increased owing to the fact that stocks of many foundries have become low.

Old Material.—The market shows very little life and is weak. There is no demand for either Cleveland or Valley mills for scrap, but there is expectation of an improvement after the holidays. Heavy melting steel is quoted at $17 to $17.50 for Youngstown delivery, or 50c. below recent price. A pipe foundry, at Newcomerstown, Ohio, is reported to have purchased a round lot of machinery and railroad cast scrap, and a dealer is inquiring for scrap to fill this contract at $19, delivered. The New York Central and the Big Four railroads received bids to-day on unspecified tonnages. With the rate revision, the freight rate on scrap from Cleveland to Youngstown, Warren and other Valley points and to Canton has been reduced from $2.10 to $1.89 per ton.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in.	11.00 to 11.50
Drop forge flashings under 10 in.	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

Cincinnati

Good Buying of Pig Iron in Prospect—Present Demand Fair

CINCINNATI, July 3.

Pig Iron.—Fair activity was recorded in the market during the week, and while the inquiry is light, the indications are that some good buying will be seen during the next few weeks. A Southern furnace interest booked approximately 5000 tons during the week at prices ranging from $18 to $18.50, and an attractive tonnage can still be booked at the lower figure. Included in this amount was a sale of 1000 tons to a Kentucky melter, and approximately 500 tons for shipment to Canada. The Louisville & Nashville Railroad bought approximately 1000 tons of various grades, paying $18 to $18.50 for foundry irons, and $31, Southern furnace, for charcoal. Northern irons were more active, and we note a sale of 500 tons to a central Ohio melter at $24, Ironton base, an advance of 50c. A number of smaller sales of foundry and malleable grades were booked at the same figure. A Michigan melter took 1500 tons of silvery for third quarter shipment at the schedule, and a nearby melter 500 tons of Valley foundry at $24, furnace. Inquiries for 1000 and 600 tons respectively of malleable for shipment to Indiana and Illinois melters during the third quarter are the only ones of size before the trade. There is also an inquiry for 1000 tons of Bessemer from outside the district. Furnaces report shipping instructions received on Monday for large tonnages of iron, melters being anxious to take advantage of the new freight rates, and also to get in a supply of iron in case railroad traffic is curtailed by strikes.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$22.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	22.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	26.27
Basic Northern	27.27
Malleable	26.27

Coke.—The demand for foundry and domestic coke is showing a steady gain, and contracts for last half are being negotiated at open prices. The price situation is firm, but unchanged from last week.

Finished Material.—While the number of orders for finished material has shown the customary falling off at this season of the year, specifications on contracts are coming in at a highly satisfactory rate. There were no large orders placed during the week and the inquiries consisted principally of lots under 100 tons. It is expected, however, that a number of inquiries for third quarter delivery will be put out during the present week and that some now before the trade will be

closed. The demand for sheets continues heavy, most of the inquiries, however, being for earliest possible delivery. On all finished products, deliveries are running from 8 to 10 weeks, although plates are available for six weeks' delivery from some mills. Prices are showing considerable strength and several independent mills have moved up to 1.80c. on bars, shapes and plates. Very little is now heard of the 1.60c. price and 1.70c. appears to be the minimum for any reasonable delivery. On sheets the spread ranges from 2.40c. to 2.60c. on blue annealed; 3.15c. to 3.40c. on black; 4.15c. to 4.40c. on galvanized; and 4.50c. to 5c. on automobile body sheets. On wire products it is rumored that nails will shortly be advanced to $2.50 per keg. Some orders have been booked by independent mills at $2.45, base. Readjustment of discounts on woven wire fencing were made by some manufacturers during the past week, but the price situation was hardly affected thereby. In the structural field a number of projects involving considerable tonnages of reinforcing bars are expected to come out within the next week or so. Two new inquiries were issued for steel buildings, but only one of consequence was made. A number of fair-sized awards will likely be made this week.

Warehouse Business.—Jobbers report a very good week and with mills getting further behind on deliveries, are looking forward to continued good business. Prices are very firm, and while it was expected advances would be made of approximately $2 a ton, these have not developed as yet.

Jobbers quote: Iron and steel bars, 2.75c. base; hoops, 3.60c.; bands, 3.35c. base; shapes and plates, 2.85c. base; reinforcing bars, 2.82½c. base; cold-rolled rounds, 3.35c. base; flats, squares and hexagons, 3.85c. base; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 9 annealed wire, $2.70 per 100 lb.; common wire nails, $2.85 per keg, base.

Old Material.—The local scrap market continues inactive, but there is a good demand for blast furnace scrap for shipment out of the district. Steel mill grades and cast scrap are quiet. Dealers are marking time, and are not actively buying or selling. Prices, while inclined to be somewhat soft, are unchanged in the absence of trading of consequence.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel	$15.25 to $15.50
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 16.50
Iron rails	14.00 to 15.00
Iron car axles	18.00 to 19.00
Low phosphorus melting	16.00 to 16.25
Cast borings	12.50 to 12.75
Machine shop turnings	11.50 to 12.00
Mixed borings and short turnings	12.50 to 12.75
Compressed steel	12.85 to 13.25
Railroad wrought	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Light bundled sheet stampings	10.00 to 10.25
Steel axle turnings	13.00 to 13.50
No. 1 cast	17.00 to 17.50
No. 1 busheling	11.25 to 11.75
Drop forge flashings over 10 in	11.00 to 11.50
Drop forge flashings under 10 in	11.25 to 11.75
Railroad grate bars	14.00 to 14.50
Stove plate	14.00 to 14.50
Pipes and flues	11.00 to 11.50

San Francisco

SAN FRANCISCO, June 28.

Pig Iron.—New business in pig iron has been lighter during the past two weeks, probably due to the liberal buying of the preceding few weeks. Consumers, for the most part, are well supplied for current needs, and with the more apparent settling of prices, there is not the same amount of purchasing for future requirements. An Oakland interest has just taken 500 tons of English material; while the price is not divulged, it is understood to be around $30, delivered. Conditions in the foundry trade appear to be improving, as indicated by the gradual increase in pig iron consumption, and manufacturers likewise are feeling the steady expansion of activities.

Cast Iron Pipe.—A satisfactory condition prevails on the Coast, but no very large volume of business seems to be offering at present. There are a few good-sized prospects, almost exclusively from municipal sources, one of the best of which is an inquiry from Monterey Park for 1800 tons of 4-12-in. material. Los Angeles is in the market for 675 tons of 24-in. and a considerable volume of smaller tonnages. Glendale has just closed for 700 tons. Private contracts are said to be rather light at present, and the market inclined to be slow. Prices are maintaining the increase recorded a short time ago, being firm at approximately $54, delivered. Soil pipe continues scarce, and manufacturers are showing no disposition to accept orders other than those subject to the mill's delivery, the outer limit of which is generally set at about eight weeks. This inability of mills to meet the demand is accompanied by the lack of an adequate number of freighters in the intercoastal service, which makes it difficult to handle the tonnage offered. It is expected, however, that this latter condition will be relieved in about two months. The active demand for plumbers' brass goods likewise is tending to strengthen that market.

Finished Iron and Steel.—The expansion of building and construction operations, observed several weeks ago, continues, and the general opinion appears to be that the market is giving evidence of stability, favorable to a steady buying demand. No great change in prices of the heavy materials is apparent, but the levels recently reached are being held. Demand is diversified, the greater volume comprising the smaller tonnages for stock and shop needs. Oil well operations in the South are prevailingly active. One of the best prospects is that for 2080 tons of plates and mixed structural material for storage tanks. There is also an inquiry for from 400 to 500 tons of plates for a pipe line. The contract for 500 tons of rails and fittings for the new dock at San Pedro has been awarded to a local interest. Among the larger jobs in sight around San Francisco are the $2,500,000 11-story commercial hotel and theater building to be constructed at Eighth and Market streets, San Francisco; and the $2,000,000 Athens Athletic Club building, which will be located in Oakland.

Coke.—Approximately the same condition as prevails in pig iron rules in the coke situation. A good, steady business, generally in small lots and carloads, continues. Almost the only single sale of any proportions was that for 500 tons of English coke for a local consumer. There is no apparent change in market values, domestic material being fairly steady at between $8 and $8.50, f.o.b. ovens, for good quality, while foreign brings from $18.50 to $19.50 delivered.

Old Material.—Some improvement in the consumption of scrap, particularly cast scrap, is reported by the larger users. Although many are pretty well stocked for immediate needs, a perceptible increase in the weekly volume of buying is observed, which is taken by the trade to indicate a gradual recovery in this market. Prices appear firm at $10 a gross ton for heavy melting, since buyers experience difficulty in purchasing for less, and cast iron scrap ranges from about $21 to $22, delivered at consumers' works. Recently some holders have been selling for Japanese account considerable amounts of scrap from the cruiser Brooklyn, which has been dismantled, perhaps 2000 tons in all. The Pacific Coast Steel Co. is now operating two open-hearth furnaces out of six. For many months it was operating only one.

Trade Changes

The Wilson Welder & Metals Co., Inc., 132 King Street, New York, recently appointed the King-Knight Co., Underwood Building, San Francisco, exclusive representative in central and northern California for Wilson Plastic-arc welding machines and Wilson "COLOR-TIPT" metals.

The American Sheet and Tin Plate Co. is now located in its new office in the Empire Building, 71 Broadway, New York. E. E. Winckler is manager of sales.

The Turbine Air Tool Co., Cleveland, has moved its executive offices from 710 Huron Road to 301 Chamber of Commerce Building.

The Hampden Corundum Wheel Co., Springfield, Mass., has changed its name to Hampden Grinding Wheel Co.

HIGH COAL PRICES

Steel Companies Buying with More Caution in Mahoning Valley

YOUNGSTOWN, July 3.—One Valley independent which predicted a $37.50 price on sheet bars for August and September deliveries has extended the current quotation of $35 to apply on August shipments. Non-integrated sheet makers covered on bar requirements by contract expect the $35 price to apply throughout the third quarter.

Some doubt as to the sufficiency of coal supplies beyond Aug. 1 is now expressed by interests which have heretofore shown no apprehension over the fuel situation. Prices have exhibited a firmer tendency the past week, both for Southern coal suitable for coking and for Pittsburgh district coal.

West Virginia and Kentucky coal, of good grade, is purchasable at $3.50 and likely somewhat less, industrial buyers believe, though some mines in those districts have recently quoted up to $3.75. One of the large Valley buyers, which entered the market extensively shortly following the outbreak of the strike of union miners, has paid an average of $2.35 per ton for an amount ranging up to 2500 carloads. The bulk of this coal came from the Kentucky field.

In the Pittsburgh district, operators are asking prices ranging up to $4.50 and $5, and the quality in some cases is not so good as the southern coal.

Owing to susceptibility of the price situation to demand, steel plants are buying with more caution and are sounding the market more carefully.

The Trumbull Steel Co., Youngstown Sheet & Tube Co. and Republic Iron & Steel Co. are operating their own mines in Pennsylvania in a small way, the largest tonnage being produced by the Trumbull company. No steps have yet been taken by the Brier Hill Steel Co. for resumption of its mines in Pennsylvania.

Diversion of coal to the lakes for Northwest consignment will have the usual effect of contracting supplies which would otherwise be available for Middle West industrial consumption, l rge interests point out. Pressure in this respect is likely to be more pronounced this year in view of disturbed working conditions in both the union and non-union fields. For this reason, industrial buyers beileve it will be more difficult to obtain adequate supplies a month hence.

Labor Causes Anxiety

The labor situation is likewise causing some anxiety, and Valley independents are joining in the movement to seek modification of the existing immigration laws which greatly restrict the number of immigrants to be admitted into this country in 1922 and 1923. In late years common labor in many of the steel plants has been recruited to a large degree from immigrants coming from Hungary, Czecho-Slovakia, Jugoslavia and Poland. Restriction on immigration from these countries has cut into the common labor supply of the larger steel employers, a situation looming more serious as operations approach normal.

Mid-summer weather is likewise cutting into hot mill production. A Youngstown independent which had 15 mills scheduled last week, was compelled to reduce the number to 12 before the end of the week, because workmen failed to report and it was unable to assemble full mill crews.

Sheet Prices

Sheet prices are reaching more stable levels in a general way and the higher range which recently applied, namely 2.60c. for blue annealed, 3.40c. for black and 4.40c. for galvanized is disappearing. One of the principal Valley interests, in fact, is accepting tonnage at the levels of the leading interest, 2.40c., 3.15c. and 4.15c. respectively for the three grades. Some slack in urgency of demand has likewise been partially responsible for this situation. Galvanized grades are in strongest demand at this time, particularly for roofing purposes, and several interests are unable to give shipments under six weeks.

The principal Valley producer of full finished stock is virtually out of the market, capacity being occupied in excess of two to three months ahead on orders from its regular customers, chiefly automobile and body makers. The 4.75c. price is applying on all current No. 22 gage auto body stock, and is characterized as very firm.

Active Demand For Pipe

Pipe requirements continue in unabated volume, both for large and small sizes, jobbers being active factors in the market. Resumption of the Bessemer department July 5 of the Republic Iron & Steel Co. relieves the pressure for Bessemer steel, and will be followed by an increase in the number of active pipe mills operated by the company, from five to six. Demand has warranted production from the entire group of pipe furnaces, but has been held in check by shortage of Bessemer steel, required especially for buttweld sizes of tubes.

Active demand for steel bars, exceeding supply, is manifest. In this district the minimum price is now 1.75c., as compared with a recent minimum of 1.70c.

Valley pig iron capacity is now occupied at 75 per cent., only the 18 largest and most efficient blast furnaces of the 27, pouring. This enlargement in production is relieving some of the pressure which existed for a time in the iron market, and deviations from the $25 level for basic iron are occasionally noted. This price, however, still represents the market, say producers, who declare costs of production warrant maintenance of this quotation. It compares with a low of $17.75 several months ago.

Seven Furnaces Blown In

Since April 1, seven blast furnaces have been blown in this territory requiring fully 5000 tons of coal daily for their maintenance. In addition, rolling mill schedules have been expanded, creating enlarged demands for coal. Makers appear covered until Aug. 1 as a general rule. If coal costs are still further increased after that date, because of accumulated demands, they will be reflected in higher steel prices, say the independents.

Valley interests are endeavoring to encourage trade by naming fair prices, believing that quotations which are too high will discourage buying and react disadvantageously. Higher prices now prevailing, they point out, as compared with two months ago, are largely due to advanced coal, iron and scrap costs.

Scrap metals have sagged somewhat the past ten days. Dealers have been offering heavy melting at $18, which compares with a recent high of $19. One interest, in fact, has been getting some tonnage under contract at $17, though the seller has been making strenuous efforts to annul the agreement. Compressed sheet scrap has been sold at $16.40.

Some surplus wire rod tonnage has been offered by the Youngstown Sheet & Tube Co., but prices are being quoted only on a definite bid for tonnage, and are likely higher than $40.

Algoma Rail Mill Gets 48,000-Ton Order—Resumes Operation

The Algoma Steel Corporation's rail mill at Saulte Ste. Marie, Ont., resumed operations on full time Monday, July 3, the company having just closed a contract with the Canadian Pacific Railroad for 48,000 tons of heavy rails. President Franz says that Canadian business is improving steadily and he believes the plant will be kept running from now on.

Steel of not over 0.15 per cent carbon and minimum tensile strength of 47,000 lb. per sq. in. and that of not over 0.20 per cent carbon and minimum tensile strength of 52,000 lb. per sq. in. are satisfactory for forge welding of pipe lines, penstocks, tank-car work and similar construction, according to Frank N. Speller, metallurgical engineer, National Tube Co., Pittsburgh, in a paper read before the American Society of Mechanical Engineers.

FABRICATED STEEL BUSINESS

Bridge and Building Awards and Tonnages Pending at Leading Centers

Awards for fabricated steel work for the past week include the following:

Michigan Central Railroad bridge at Niagara Falls, N. Y., 8,000 tons; American Bridge Co., low bidder, but contract not yet awarded.

Building for Beattie Mfg. Co., Little Falls, N. J., 250 tons, to J. E. Brooks Co.

Two bridges for the Baltimore & Ohio Railroad, 400 tons, to Fort Pitt Bridge Works.

Lincoln Life Insurance Building, Fort Wayne, Ind., 1,000 tons, to Lackawanna Bridge Works Corporation.

Bridge over Gunpowder River, Baltimore, Md., to McLean Construction Co.; Second-hand material to be furnished.

Bartlett-Hayward Co., Baltimore, Md., 900 tons of I-bars, to American Bridge Co.

Tomlinson bridge at New Haven, Conn., 1,400 tons, to Phoenix Bridge Works.

Bigelow-Hartford Carpet Co., Thompsonville, Conn., 300 tons, to American Bridge Co.

Telephone Exchange Building, Brooklyn, 3,000 tons; general erection contract to Eidlitz & Ross; steel to be fabricated by Bethlehem Steel Bridge Corporation.

Missouri, Kansas & Texas Railway of Texas, locomotive repair shop, Waco, Tex., 1,400 tons, to Mt. Vernon Bridge Co.

Missouri Pacific Railroad, bridge over Kaw River, Kansas City, 501 tons, to King Bridge Co.

Missouri Pacific Railroad, two 35-ft. girder spans and one 90-ft. through plate girder span for bridge No. 113, Joplin division, 127 tons, to American Bridge Co.

Federal Ice & Cold Storage Co., St. Louis, 169 tons, to Mississippi Valley Structural Steel Co.

Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich., 750 tons, to American Bridge Co.

Marland Refining Co., Oklahoma City, Okla., 20 small tanks, 600 tons, to Chicago Bridge & Iron Works.

Pantlind Hotel, Grand Rapids, Mich., addition, 300 tons, to Lackawanna Bridge Works Corporation.

Hayes Office Building, Erie, Pa., 600 tons, to Lackawanna Bridge Works Corporation.

Masonic Temple, Binghamton, N. Y., 300 tons, to Lackawanna Bridge Works Corporation.

First National Bank, Ashland, Ky., 1,500 tons, to Fort Pitt Bridge Co.

Nash Motor Co., new body and sheet metal shop, 200 tons, additional, (original letting, 400 tons), to Worden-Allen Co., Milwaukee.

Warehouse for Eggleston Brothers, Long Island City, N. Y., 300 tons, to Jones & Laughlin Steel Co.

High tension transmission towers for Ohio Public Service Corporation, 3500 tons, to American Bridge Co.

Structural Projects Pending

Inquiries for fabricated steel work which may be added to lists of pending projects include the following:

Masonic Temple, Paterson, N. J., 400 tons.

Sterling Hall of Medicine, New Haven, Conn., 600 tons.

Emerson Building, 1431 Broadway, New York, 400 tons.

Repairs to Williamsburg bridge, New York, 700 tons.

National Biscuit Co., three buildings, at Cincinnati, Philadelphia and Buffalo, 300 tons.

Long Island Railroad, crane runway, 400 tons.

Citizens Hotel, Charlotte, N. C., 700 tons; bids close July 7.

Federal Reserve Bank, St. Louis, 370 tons.

Car dumper for Ford Motor Co., Detroit, 725 tons.

Foundation Co., stock house, Cerveceria Modelo S. A., Mexico City, Mexico, 425 tons.

Johnson Building, Knoxville, Tenn., 200 tons, bids in.

Caldwell Building, Nashville, Tenn., 300 tons, bids in.

Office building 1200 Washington Boulevard, Detroit, 1240 tons.

Car shops, Erie Railroad, Hornell, N. Y., 900 tons, Bates & Rogers, Chicago, general contractors.

Methodist Episcopal church house, Champaign, Ill., 250 tons.

Painter Building, Cleveland, 170 tons, bids taken.

Standard Envelope Co., Cleveland, 200 tons, bids taken.

Cleveland Machine Co., Cleveland factory, 250 tons.

Highway bridge, Schenectady, N. Y., 500 tons, American Construction Co., Cleveland, low bidder.

West Technical High School, Cleveland, 450 tons, bids taken.

Mirimar Hotel, Cleveland, 1500 tons, previously reported as 700 tons.

Refractories Prices Have Been Advanced

PITTSBURGH, July 3.—Increases in prices of fire clay brick and other refractories recently were announced by manufacturers in the various producing districts. The advance includes all grades except Birmingham silica brick, which remain at the recent basis of $40 per 1000. Fire clay brick have been advanced $2 per 1000 in all districts, thus establishing a mimimum of $31 per 1000 for high heat duty, Pennsylvania, Kentucky, Illinois and Missouri brick, and of $32 for this grade at Ohio works. The new prices for silica brick represent an advance of $3 per 1000, while there has been a like advance in magnesite brick, $2 a ton in Austrian grain magnesite and $2 a ton in chrome brick.

Advances in magnesite brick and grain magnesite are explained largely by the action of the Senate in connection with the tariff on foreign magnesite, this development having had the effect of stimulating the demand. Demand for fire clay and silica brick has been increasing steadily, following the failure of the coal strike to affect steel plant operations seriously, and in trying to increase production to care for the orders, not a few refractories manufacturers have esperienced labor shortages which have forced increases in wages. Fuel costs also have climbed, whether the manufacturers, as many do, own their own mines, or are dependent upon the open market for supplies. The new prices do not apply on such orders as were on the books of makers prior to the advance which carried a fixed price, and as usual consumers were given the opportunity to place orders before the increase became effective.

We quote per 1000 f.o.b. works:

Fire Clay	High Duty	Moderate Duty
Pennsylvania	$34.00 to $36.00	$32.00 to $34.00
Ohio	32.00 to 34.00	30.00 to 32.00
Kentucky	34.00 to 37.00	32.00 to 34.00
Illinois	34.00 to 36.00	32.00 to 34.00
Missouri	34.00 to 36.00	30.00 to 34.00
Silica Brick		
Pennsylvania		33.00 to 35.00
Chicago		38.00 to 41.00
Birmingham		40.00
Standard size per net ton (f.o.b. Baltimore and Chester, Pa.)		56.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		30.00
Chrome Brick		
Standard size, per net ton		42.00

Plant Operations

The Ryan Foundry Co., Lansing, Mich., has taken an order for castings for 100,000 motors for the Grant Motor Co., same city, and is arranging for immediate increased production.

The American Steel & Wire Co., Anderson, Ind., is advancing production in different departments of its local mill. The wire nail department has booked some heavy orders for foreign shipment.

The Packard Motor Car Co., Detroit, has adopted a production schedule of 2,000 single-six automobiles a month, doubling the monthly output heretofore operative since last April, when this model car was announced. During the past few weeks, the company has made the heaviest shipments in its history.

The Texas & Pacific Railroad Co. is increasing operations at its repair shops at Marshall, Tex., and about 200 men will be added to the working force at once, making a total of 600 workers now on the payroll.

The New Era Spring & Specialty Co., Grand Rapids, Mich., has adopted a night shift operation in addition to the regular day operating schedule. Orders now being received are in excess of production.

The Cadillac Malleable Iron Co., Cadillac, Mich., is arranging for the early operation of its new local foundry now nearing completion. It is expected to give employment to about 100 men at the plant.

The Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., is increasing production at its plant, with operating schedule close to plant capacity. The wages of all employees have been advanced, effective July 10.

The Moon Motor Car Co., St. Louis, has adopted a production schedule call for 1,000 complete cars during each month of July and August.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Plates

Sheared, tank quality, base, per lb.....1.70c. to 1.80c.

Structural Material

Beams, channels, etc.....1.70c. to 1.80c.

Iron and Steel Bars

Soft steel bars, base, per lb.....1.70c. to 1.80c.
Refined iron bars, base per lb.....2.20c.

Hot-Rolled Flats

Hoops, base, per lb.....2.50c. to 2.75c.
Bands, base, per lb.....2.50c. to 2.75c.
Strips, base, per lb.....2.50c. to 2.75c.

Cold-Finished Steels

Bars and shafting, base, per lb.....2.10c.
Strips, base, per lb.....4.00c.

Wire Products

Nails, base, per keg.....$2.40 to $2.50
Bright plain wire, base, per 100 lb..... 2.25
Annealed fence wire, base, per 100 lb..... 2.25
Galvanized wire, base, per 100 lb..... 2.75
Galvanized barbed, base, per 100 lb..... 3.05 to 3.15
Galvanized staples, base, per keg..... 3.05 to 3.15
Painted barbed wire, base, per 100 lb..... 2.55 to 2.65
Polished staples, base per keg..... 2.55 to 2.65
Cement coated nails, base, per count keg..... 1.90 to 2.00
Woven fence, carloads.....73 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, small, cut threads....60 and 10 per cent off list
Machine bolts, larger and longer.....60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Cut threads .....60 per cent off list
Longer and larger sizes .....60 per cent off list
Lag bolts .....60, 10 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in.:
Smaller and shorter .....50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. blank nuts.....$4.50 off list
Hot pressed nuts, tapped .....$4.50 off list
C.p.c. and t. sq. or hex. nuts, blank.....$4.50 off list
C.p.c. and t. sq. or hex. nuts, tapped.....$4.50 off list
Semi-finished hex. nuts:
9/16 in. and smaller, U. S. S.....80 and10 per cent off list
⅝ in. and larger, U. S. S...75 and 10 and 10 per cent off list
Small sizes, S. A. E.....80, 10 and 10 per cent off list
S. A. E. ⅝ in. and larger...75 and 10 and 10 per cent off list
Stove bolts in packages.....80 and 5 per cent off list
Stove bolts in bulk.....80, 5 and 2½ per cent off list
Tire bolts .....65 per cent off list
Track bolts in carloads.....3.00c. to 3.25c. base
Track bolts, less than 200 kegs.....3.50c. to 3.75c. base

Cap and Set Screws

Milled square and hex. head cap screws, 75 and 10 per cent off list
Milled set screws.....75 per cent off list
Upset cap screws.....80 per cent off list
Upset set screws.....80 and 5 per cent off list

Rivets

Large structural and ship rivets, base per 100 lb.....$2.40
Large boiler rivets, base per 100 lb..... 2.50
Small rivets .....70 and 5 per cent off list

Track Equipment

Spikes, 9/16 in. and larger, base, per 100 lb....$2.25 to $2.35
Spikes, ½ in. and smaller, base, per 100 lb..... 2.50
Spikes, boat and barge, base, per 100 lb..... 2.50
Track bolts, base, per 100 lb..... 3.25
Tie plates, per 100 lb.....$1.75 to 2.00
Angle bars, base, per 100 lb..... 2.40

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	54½	28	¼ to ⅜.....	+ 3½	+22½
¼ to ⅜.....	60	33½	½	36½	18½
½	65	50½	¾	42½	27½
⅝	69	56½	1 to 1½.....	44½	29½
1 to 3.....	71	58½			

Lap Weld

2	64	51½	2	39½	25½
2½ to 6.....	68	55½	2½ to 6.....	42½	29½
7 to 8.....	65	51½	7 to 12.....	40½	27½
9 to 12.....	64	50½			

Butt Weld, extra strong, plain ends

⅛	50½	33	¼ to ⅜.....+	4½	+37½
¼ to ⅜.....	56	38½	½	35½	23½
½	62	50½	¾	42½	28½
¾	67	55½	1 to 1½.....	44½	30½
1 to 1½.....	69	57½			
2 to 3.....	70	58½			

Lap Weld, extra strong, plain ends

2	62	50½	2	40½	27½
2½ to 4.....	66	54½	2½ to 4.....	43½	31½
4½ to 6.....	65	53½	4½ to 6.....	42½	30½
7 to 8.....	61	47½	7 to 8.....	35½	23½
9 to 12.....	55	41½	9 to 12	30½	18½

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 and 2½ per cent.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	26½	1½ in.	5
2 to 2¼ in.....	41	1¾ to 1⅞ in.....	15
2½ to 3 in.....	52	2 to 2¼ in.....	25
3¼ to 13 in.....	57	2½ to 3 in.....	30
		3¼ to 4½ in.....	32

To large buyers of steel tubes a supplementary discount of 5 per cent is allowed.

Standard Commercial Seamless Boiler Tubes

Discounts on cold-drawn or hot-rolled tubes in carload lots, f.o.b. Pittsburgh, follow:

1 in.	60	2½ and 2¾ in.....	43
1¼ and 1½ in.....	52	3 in.	47
1¾ in.	36	3½ to 4 in.....	52
2 and 2¼ in.....	39	4½ in. to 5 in.....	44

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Tin Plate

Standard cokes, per base box.....$4.75

Terne Plate

(Per package, 200-lb.)

8-lb. coating	$9.30	25-lb. coating I. C.....$14.25	
8-lb. coating I. C.....	9.60	30-lb. coating I. C.....	15.25
15-lb. coating I. C.....	11.80	35-lb. coating I. C.....	16.25
20-lb. coating I. C.....	13.00	40-lb. coating I. C.....	17.25

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.40c. to 2.60c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.15c. to 3.40c.

Galvanized

No. 28 (base), per lb.....4.15c. to 4.40c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.15c. to 3.40c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.325	Buffalo	$0.265	St. Louis	0.43
Philadelphia, export...	0.265	Cleveland	0.215	Kansas City	$0.735
Baltimore, domestic...	0.315	Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)...	0.705
Baltimore, export.....	0.255	Detroit	0.295	St. Paul	0.595
New York, domestic...	0.34	Cincinnati	0.295	Omaha	0.735
New York, export.....	0.285	Indianapolis	0.31	Omaha (pipe)	0.705
Boston, domestic	0.365	Chicago	0.34	Denver	1.275
Boston, export	0.285			Denver (pipe)	1.215

Pacific Coast $1.50			
Pac. Coast, ship plates	1.20		
Birmingham	0.69		
Memphis	0.385		
Jacksonville, all rail..	0.50		
Jacksonville, rail and water	0.415		
New Orleans	0.515		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

PERSONAL

William J. Gruss, who has been the head of the pig iron sales department of Pickands, Mather & Co., Cleveland, since 1913, has tendered his resignation, effective July 10, to become manager of sales of the Gartland-Haswell-Rentschler interests, operating 12 or more gray iron foundries in the Central West. He will have his headquarters in Dayton, Ohio, and will assume his new duties Aug. 1. Mr. Gruss is widely known among the pig iron manufacturers of the country and also has an extensive acquaintance with the foundry trade, and is qualified for his new position by his many years' experience in the pig iron business. He was born in Salem, Ohio, in 1878, and has been with Pickands, Mather & Co. over 28 years, the Cleveland office of that firm being his first place of employment. There he worked up through successive stages until he was placed in an important executive position. He is a member of the American Iron and Steel Institute and of the Union Club, Cleveland Athletic Club, and Cleveland Chamber of Commerce. Mr. Gruss will be succeeded by George W. Striebing, who has been connected with the pig iron sales and ore sales departments of the Pickands, Mather & Co. for 11 years.

WILLIAM J. GRUSS

Lewis T. Rights, contracting manager at New York for the Shoemaker-Satterthwait Bridge Co., sailed July 1 for a two months' trip in England, France, Belgium and Switzerland.

Henry Held, secretary and treasurer Rundle Mfg. Co., Milwaukee, manufacturer of bathtubs and enameled sanitary ware, has been elected president and treasurer. He succeeds the late Robert T. Hazelwood. L. R. Kinnear has been elected vice-president; A. C. Held, secretary, and H. F. Galdammer, assistant treasurer.

J. C. Gore, for 12 years with Domhoff & Joyce Co., pig iron and coke brokers, has been appointed resident manager at Chicago, vice J. P. Crowley, resigned. For the past nine years Mr. Gore has been in the Indianapolis office of the company. He will be assisted at Chicago by L. H. Hoerdt, formerly of the St. Louis office.

Frederick M. Spencer, superintendent Landers, Frary & Clark, Meriden, Conn., cutlery plant, has resigned to associate himself with the International Silver Co.

C. F. Ford, who for the past several years has been with the Chicago Pulley & Shafting Co., has recently joined the engineering sales forces of W. A. Jones Foundry & Machine Co., manufacturer of speed reducers and power transmitting machinery, Chicago. In the near future, Mr. Ford will be located in Minneapolis, Minn., as manager of the Jones branch there. Several years ago, when the Jones company was in its old plant at North Avenue and Noble Street, Chicago, Mr. Ford was transmission engineer and acted in that capacity over an extended period.

S. Glen Vinson, secretary and general manager Ideal Electric & Mfg. Co., Mansfield, Ohio, left April 15 for the Orient, where he will make a survey of business conditions. Mr. Vinson will include on this trip all the larger cities in Japan, China, Philippine Islands, and India. He expects to return to the States about Oct. 1.

Floyd H. Smith, formerly with the Pierce-Arrow Motor Car Co., Buffalo, as director of purchases, has become associated with the Simms Magneto Co., East Orange, N. J., as assistant general manager.

H. E. Cyphers, formerly sales manager of the Brown-Hunkele Corporation, Newark, N. J., is now associated with the McCool-Ellis Co., that city, handling the sales of used machinery, boilers, motors and compressors.

Arthur A. Hammerschlag, president Carnegie Institute of Technology, Pittsburgh, since 1903, has resigned and will become consulting engineer and advisor to corporations, with offices in Pittsburgh and New York.

Charles H. McKnight, who has held the positions of president and chairman of the Carbon Steel Co., Pittsburgh, resigned from the former office at a recent meeting of the board of directors. His successor is C. F. Blue, Jr., who has been vice-president, and Frank C. Neale, president Kittanning Iron & Steel Mfg. Co., controlled by the Carbon Steel Co., and a director of the latter, has been made vice-president, in succession to Mr. Blue.

J. F. Keller, vice-president Keller Mechanical Engraving Co., Brooklyn, has been awarded the Edward Longstreth medal of merit by the Franklin Institute. The award was made in consideration of very substantial improvements and inventions made by Mr. Keller in the art of mechanical die cutting, as represented by his automatic die cutting machine of the reproducing type. In the citation accompanying the presentation, it was stated that "the institute believes that credit should be given Mr. Keller for having met a need for increasing die production and reproduction over that which was possible by the old hand method and skilled operators. His efforts have resulted in easier, quicker and better production by less skillful operators, and a reduction of the costs."

J. F. KELLER

Anson W. Burchard, vice-chairman of the board of directors General Electric Co., has been elected president and chairman of the board International General Electric Co., succeeding Gerard Swope, its former president who was recently chosen president of the G-E company and Charles Neave, former chairman of the I. G. E. company, who has resigned.

P. J. Connor, formerly traveling representative for the International Machine Tool Co., Indianapolis, manufacturer of the Libby turret lathe and who recently resigned from the Essley Machinery Co., Chicago, is now engaged with the Haynes Stellite Co., Chicago, in an engineering capacity with headquarters at New York.

Charles H. Bluske has been appointed Los Angeles district sales manager of the Economy Fuse & Mfg. Co., Chicago, with office at 1304 Maltman Avenue. Mr. Bluske was formerly connected with the Pacific States Electric Co., Los Angeles, and succeeds George L. Davis.

H. F. Hoevel has been appointed manager of the sand blast department of the J. W. Paxson Co., in Philadelphia. He has developed a new line of improved Hoevel-Paxson sand blast machines.

J. Allen Dillon, manager of sales, New York office, Pittsburgh Screw & Bolt Co., accompanied by his wife and son sailed on the Paris from New York July 5, for a six weeks' trip to Europe.

R. D. Shields has been appointed assistant general manager of the Ohio Machine Tool Co., Kenton, Ohio. Mr. Shields has been chief engineer of this company for several years past and will continue in that capacity.

Westinghouse Changes

The following changes in personnel have been announced by the Westinghouse Electric & Mfg. Co.:

L. C. Bullington, who has been assistant to the manager of the power department for several years, has been made assistant manager and will have charge of the general work of the power department. Charles F. Lloyd, formerly manager of the sub-station section, has been made manager of the electric division and R. E. Carothers, formerly manager of the turbine section, has been appointed manager of the steam division. The vacancies have been filled by the elevation of Bruce H. Lytle and D. O. Tylee, the former becoming manager of the sub-station section and the latter manager of the turbine section.

R. B. Mildon has been appointed general manager of the stoker department, with headquarters at South Philadelphia.

G. A. Sacchi, formerly manager of the stoker section, power department, has been appointed manager of stoker sales and will have his headquarters at South Philadelphia.

Edgar Woodrow has been appointed manager of the contract division, stoker repartment.

F. G. Hickling is now manager of the railway division, Pittsburgh district office.

C. C. Curry, formerly branch manager in Minneapolis, has been assigned to special work in connection with the St. Paul Electric Co.

Norman Stewart is branch manager in Minneapolis.

S. R. Shave has been appointed manager of the price section, power and railway departments, East Pittsburgh.

A. Heckman is now works electrical engineer at the East Pittsburgh works of the company.

F. R. Kohnstamm has been appointed acting manager, appliance section, merchandising department and will be located in Mansfield, Ohio.

J. W. Robinson will succeed C. E. Alles as manager, central station division, Chicago office.

H. A. Lynette has been appointed syndicate representative, central station division, Chicago office.

Kentucky Steel & Wire Co.'s Plant

The Kentucky Steel & Wire Co., Louisville, Ky., recently incorporated with a capitalization of $500,000, has purchased property at Thirty-second and Market streets, and has plans prepared for mill buildings to cost with equipment approximately $200,000. Wire nails, barbed wire, staples, galvanized wire nails and bent wire specialties will be manufactured. The company expects to begin manufacturing operations about Sept. 1. A. H. Dillon, formerly connected with the Youngstown Sheet & Tube Co., is president of the company, and associated with him are John R. Humphrey, Lexington, Ky., and Joseph O'Donnell, Louisville.

British Empire Steel Corporation Plans

A newspaper telegram from Montreal says that it is the intention of the British Empire Steel Corporation to spend the sum of $19,000,000 in additions and repairs to the steel plant. It is stated that engineers employed by the corporation are now engaged preparing plans for new open-hearth furnaces and a blooming mill, to cost about $10,000,000. One blast furnace is to be rebuilt and a second one extensively repaired. Other additions and improvements are to be made in the plant, it is said, the whole to cost in the vicinity of the amount above mentioned.

Stockholders of the Sharon Steel Hoop Co., Sharon, Pa., have approved recommendation of directors for an increase in the capitalization from $15,000,000 to $20,000,000. The new authorization will consist of $5,000,000 8 per cent cumulative preferred, convertible into common. It is the intention to issue at once $1,500,000 of the new authorization, this amount having been largely underwritten by shareholders pro rata at par. The new funds will give the company a net working capital of about $3,000,000 and thereby strengthen its position. It has been showing profits on operations for several months, states an official.

Eastern Steel Co. May Purchase Warwick Blast Furnaces

The Eastern Steel Co., Pottsville, Pa., which in January, 1912, leased the blast furnaces of the Warwick Iron & Steel Co., Real Estate Trust Building, Philadelphia, at Pottstown, Pa., for 99 years, is considering exercising an option to purchase the property, but no definite action has been taken.

Under the terms of the lease, the Eastern Steel Co. has the right to purchase the property of the Warwick Iron & Steel Co. at any time within fifteen years from the date of the execution of the lease for $2,000,000, less such payments in dividends as have been made upon the stock, which total $500,000. If the purchase deal goes through, the Eastern Steel Co. plans a new bond issue which probably will be about $4,000,000.

Officers of the Warwick Iron & Steel Co. are: W. S. Pilling, president; G. E. Schlegelmilch, vice-president; H. F. Hallman, secretary and treasurer.

The Eastern Steel Co. also has mills at Pottsville, Pa., for rolling structural shapes. The product of the Warwick Blast furnaces is used both for supplying the company's steel plant and for merchant trade. The annual capacity of these furnaces is 300,000 tons.

Inspection Tour of Steel Corporation Officials

An inspection tour, which is believed to be preliminary to greater use of the upper Ohio River by the United States Steel Corporation subsidiaries, was conducted by officials of the Carnegie Steel Co., June 29. A party of more than 100, including several New York officials of the Corporation, left Pittsburgh on a special train in the morning for Steubenville, Ohio, returning by river barge. Lately the Carnegie Steel Co. has been using the Ohio river between Steubenville and Pittsburgh for the shipment of coke to the Mingo, Ohio, furnaces and in bringing back coal and scrap. It is believed that the Corporation, if it does not go so far as to make distant shipments by the inland waterways as the Jones & Laughlin Steel Co. has been doing since last fall, will put in service additional barges for interplant shipments and for serving customers in and near Pittsburgh who are so situated as to be able to receive such shipments. A plan of this sort was worked out during the railroad transportation snarls two years ago, but was sidetracked when the railroad situation improved.

Thomas Iron Co. Sale Confirmed

The Thomas Iron Co., Hokendauqua, Pa., by W. A. Barrows, Jr., president, announces that the required amount of the Thomas Iron Co. stock has been deposited with Drexel & Co., bankers, Philadelphia, and the Easton Trust Co., Easton, Pa., the agreement to purchase the iron company stock by Drexel & Co. thereby becoming effective.

Stockholders of the Thomas Iron Co. who have not yet deposited their stock can, under the terms of the agreement, do so now and receive prompt payment at $50 per share.

Notwithstanding published reports that Drexel & Co. are acting for the Reading Iron Co., Mr. Barrows states that the agreement of purchase is solely with Drexel & Co. and that the use of other names in this connection has not been officially authorized.

Remington Arms Plant Taken Over

The General Electric Co. has purchased the Remington Arms Co's. plant at Bridgeport, Conn., for a price said to exceed $3,300,000. The transaction was completed last week. The General Electric Co. two years ago leased the Remington plant, with an option to purchase from the Bridgeport Liquidation Co.

NON-FERROUS METALS

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
June	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
28.....	13.75	13.50	30.87½	5.80	5.55	5.62½	5.27½
29.....	13.75	13.50	30.70	5.80	5.55	5.65	5.30
30.....	13.75	13.50	30.87½	5.80	5.55	5.67½	5.32½
July 1.....	13.75	13.50	....	5.75	5.55	5.70	5.35

*Refinery quotation.

New York

NEW YORK, July 3.

Because of the Independence Day holiday all the markets have virtually been closed since Saturday, July 1, and almost no trading is reported. In the past week the copper and zinc markets have turned stronger, while lead has become slightly easier. The tin market has been stagnant with prices substantially unchanged.

Copper.—Sentiment is generally unanimous that there will be no further recession in the electrolytic copper market for some time and that the undercurrent is essentially strong with the price tendency upward. There is more inquiry for third quarter and last half delivery and metal for July shipment is becoming scarcer. According to some accounts it is difficult to buy electrolytic copper for July or August shipment at 13.75c., delivered, and it is likely that within two or three days the minimum will be 13.87½c. for this position, with the probability that this level will be the minimum for third quarter. Owing to the strong position of the market, consumers are starting to inquire more liberally. The export market is steady and strong. Sales for June are estimated to have been about 80,000,000 lb., which is considerably lower than April or May, but large under the circumstances. Lake copper is quoted at 13.75c. to 14c., delivered.

Copper Averages.—The average price of Lake copper for the month of June, based on daily quotations in THE IRON AGE, was 13.87c. The average price of electrolytic copper was 13.62c., refinery, or 13.87c., delivered.

Tin.—Buying has virtually come to a standstill and the market is stagnant. The bulk of the large consignment of 2500 tons of tin which arrived June 17 on the steamer Knight Templar has been shipped to consumers and any moderate unsold portions are in strong hands. There is also no pressure to sell lots due to arrive and the position of the market is, as the result, satisfactory. With the holiday in the tin market extending from June 30 to Wednesday, July 5, developments have been very few and this situation is accentuated by the fact that the New York Metal Exchange is also closed during this period. Private cables to-day indicate an advance of approximately £2 to £3 per ton over the London quotations prevailing Friday, June 30, which were £152 12s. 6d. for spot standard, £153 12s. 6d for future standard and £155 12s. 6d for spot Straits. On June 29 a little business in Straits tin was done at a range of 30.62½c. to 30.75c., New York. Total arrivals for June are reported as 5580 tons. The deliveries into consumption have been 5130 tons with 2371 tons in stock and landing on June 30. The latter data are larger than the trade expected.

Lead.—The market is quiet with less demand than there was recently and there is a slightly easing in quotations, particularly at St. Louis. At that point the market is quoted at 5.55c., but it is probable that a desirable order could be put through at 5.50c. There are signs also that the outside market and that of the leading interest are virtually the same at New York. Consumption continues very heavy.

Zinc.—Prices have advanced perceptibly in the past week until prime Western for early delivery is now quoted at a minimum of 5.35c., St. Louis, or 5.70c., New York. Consumers have placed fair sized orders recently and dealers are also buying, but producers generally are inclined to revise quotations as far as possible.

Aluminum.—Wholesale lots of virgin metal, 98 to 99 per cent pure, are quoted by the leading interest at 19.10c., f.o.b. plant, with the same grade of imported metal available from dealers from 17.75c. to 18c., duty paid, New York.

Antimony.—The market is quiet and wholesale lots for early delivery are quoted at 5c., New York, duty paid.

Old Metals.—Business has been rather quiet but values continue firm. Dealers' selling prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	13.50
Copper, heavy and wire	12.75
Copper, light and bottoms	11.00
Heavy machine composition	10.25
Brass, heavy	8.00
Brass, light	6.50
No. 1 red brass or composition turnings	8.75
No. 1 yellow rod brass turnings	7.50
Lead, heavy	4.875
Lead, tea	3.75
Zinc	3.00

Chicago

July 3.—The metals are quiet with copper weaker and zinc higher. The advance in zinc seems to be explained by the disinclination of producers to sell at recent low levels. It is pointed out that zinc ore is nearly as high as when zinc sold for 8c. Copper is very weak and in some cases is being sold at considerable concessions under the nominally quoted market. Old metal prices are unchanged. We quote in carload lots: Lake copper, 13.75c.; tin, 32.50c.; lead, 5.60c.; spelter, 5.40c.; antimony, 7c., in less than carload lots. On old metals we quote. Copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 8.75c.; red brass, 8.25c.; yellow brass, 6.75c.; lead pipe, 4.25c.; zinc, 2.75c.; pewter, No. 1, 20c.; tin foil, 22.50c.; block tin, 25c.; all buying prices for less than carload lots.

Traffic Congestion in Non-Union Fields

WASHINGTON, July 4.—Present indications point to a total production of less than 5,300,000 tons of coal during the thirteenth week of the strike, according to the Geological Survey, the output of anthracite being negligible. The decline from the twelfth week, when bituminous production totaled 5,337,000 tons, is attributed to traffic congestion in the non-union fields of southeastern Kentucky and parts of southern West Virginia, which prevailed chiefly on Monday and Tuesday. The present rate of output weekly is from 5,000,000 to 6,000,000 tons below normal.

The thirteenth week opened with production at a high rate. Loading on Monday, June 26, were 16,735 cars, the largest on any Monday since the strike began. Owing to the traffic congestion, production was curtailed and loading fell off 11,000 cars on the two days following, but went up to 16,441 cars on Thursday. The decrease in loading is reported to be due not to scarcity of cars but to inability to move them faster than a certain limit set by the existing yard and track facilities and it is noted that the railroads concerned are making new records in volume of traffic handled.

The number of unbilled cars at the mines continues to steadily decrease and was down to 2190 cars of soft coal on June 29 for a group of 22 of the largest carriers holding about 75 per cent of the total number of unbilled loads. This was the lowest point reached up to that date. On all lines on June 24, the number of unbilled cars of soft coal was 3678.

June cement shipments of the Bessemer Limestone & Cement Co., Youngstown, Ohio, from its Bessemer, Pa., property approximated 150,000 bbl., a new monthly record. The company reports firm demand for cement for building construction and road building. Its fluxstone shipments are likewise expanding as blast furnace operations are enlarged. It supplies fluxstone to stacks in the Mahoning Valley and in the Pittsburgh district.

Machinery Markets and News of the Works

AUTOMOBILE COMPANIES BUY

Ford Motor Co. and the Studebaker Corporation Are Large Purchasers

Manufacturers of Turret Lathes Advance Prices 10 Per Cent—Radial Drills Also Higher

Large automobile production has brought manufacturers into the market for more shop equipment. The Ford Motor Co., Detroit, has placed orders for about $150,000 worth of tools, including a large lathe, die sinking machines, vertical boring mills, etc. It is reported that the Fisher Body Corporation and the Wilson Body Co., Detroit, will be in the market within a month for considerable equipment, mostly woodworking tools. The Studebaker Corporation, South Bend, Ind., has bought some of the tools for which it recently inquired. One purchase of grinding machines totaled about $40,000. The Continental Motors Co., Muskegon, Mich., is buying tools for production of motors for the Star automobile, which will be put on the market by the Durant Motors Co.

The Associated Motor Industries, a new $80,000,000 corporation organized at Dayton, Ohio, which takes in fourteen plants making automobiles, trucks and automobile parts, plans immediate expansion and speeding up of production in all of its units, which gives promise of machine-tool buying from this source.

No buying has been done in Chicago by the railroads whose inquiries for tools have recently been published. It is stated that one or two of the roads will soon purchase a part of their requirements, but no important buying is expected until the strike of railroad shopmen has been settled. The New York Central has purchased several machines.

Municipal buying continues. Joliet, Ill., has bought $25,000 worth of tools, and the Wilmington, Del., fire department has equipped a motor repair shop at a cost of $10,000. The Cleveland Board of Education has received bids on about 30 machines.

Price advances, forecasted by THE IRON AGE a few weeks ago, have been put into effect by a number of manufacturers. The Warner & Swasey Co., Cleveland, announces a 10 per cent advance, effective July 1. Radial drill manufacturers have announced new prices which are from 5 to 7½ per cent higher. Price advances are under consideration by other manufacturers, who say that increasing costs make it imperative that they obtain more money for their products.

New York

NEW YORK, July 3.

The New York Central Railroad has placed orders for an axle lathe, slotter and horizontal boring and drilling machine, but the other machines for which this road recently inquired have not been purchased. The Long Island Railroad has made no purchases against its recent inquiry for about a half dozen machines. The Erie Railroad is reported to have completed its purchase of about 25 tools. It took part new and part used tools.

The McCabe & Sheeran Machinery Corporation, New York, has sold two used Liberty frog and switch planers to the Ramapo Iron Works for its plant at Hillburn, N. Y.

Business in machine tools the past week has been rather quiet, due probably to the holidays this week as well as to the uncertainty regarding the coal situation and the railroad strike. Companies which have sales offices in various centers report that business is considerably better in the Middle West, particularly in the Chicago district, than in the East.

There was great activity in crane purchases the past week in both electric overhead and locomotive cranes. On the whole, the market is greatly improved. One manufacturer of electric hoists reports June as the best month for sales this year and manufacturers of chain blocks also report a heavy month's business in June, numerous dealers having placed orders for chain hoists for stock. Locomotive crane sales are good, although there is still a strong desire on the part of buyers to purchase used cranes when possible. In electric overhead traveling cranes no large orders are pending, but builders are bidding on a number of single cranes and there is reported to be one inquiry in this district for five 5-ton and 10-ton electric cranes.

Among recent sales are: Niles-Bement-Pond Co., two 20-ton electric cranes, 56-ft. 9-in. and 80-ft. spans, three 10-ton, 56-ft. 9-in., 57-ft. and 61-ft. 11-in. spans, two 7-ton, 53-ft. and 61-ft. 11-in. spans and one 5-ton, 27-ft. 3-in. span to the M. W. Kellogg Co., Jersey City, N. J., and a 5-ton, 68-ft. span electric crane to the McIntosh & Seymour Corporation, Auburn, N. Y.; Cleveland Crane & Engineering Co., a 40-ton, 56-ft. span gantry crane to the Phoenix Utility Co., 71 Broadway, New York; Shaw Electric Crane Co., two 3-ton electric cranes and the Chesapeake Iron Works a 10-ton, 28-ft. 4-in. span overhead crane to the Otis Elevator Co., Yonkers, N. Y.; Morgan Engineering Co., a 250-ton overhead traveling crane to the Erie Railroad for Hornell, N. Y., (two 15-ton cranes still pending); Shepard Electric Crane & Hoist Co., nine 1-ton and six ½-ton, "Liftabout" hoists to the Baltimore Car & Foundry Co., for Curtis Bay, Md.; Browning Co., a 20-ton locomotive crane to Isaac Miller's Sons, Lebanon, Pa., a 2-ton locomotive crane to Hurwitz Brothers, Syracuse, N. Y., and two 20-ton locomotive cranes to a Baltimore contractor; Philip T. King, 30 Church Street, New York, a 30-ton, 50-ft. boom used Ohio locomotive crane with 1½-yd. new Hayward bucket to the Girardeau Cement Co., St. Louis, and a 30-ton, 50-ft. boom used Ohio locomotive crane with new Hayward orange-peel bucket to the Atlas Sand Co., Hartford, Conn.; and the Ohio Locomotive Crane Co., a 20-ton, 50-ft. boom locomotive crane to the McDonald Construction Co., Flushing, N. Y.

William Thorpe, 705 Whitlock Avenue, New York, has leased property at the location noted, heretofore occupied by Bjur Brothers, for the establishment of a new plant to manufacture electrically-operated talking machines and parts.

The Buick Motor Co., 1733 Broadway, New York, has awarded contract to the Thompson-Starrett Co., 49 Wall Street, for a six-story service and repair building on Eleventh Avenue, between fifty-fifth and Fifty-sixth Streets, estimated to cost in excess of $200,000. A portion of the building will be used by the Oakland Motor Car Co.

The Orange County Hydro-Electric Corporation, Middletown, N. Y., is disposing of a bond issue of $600,000, a portion of the proceeds to be used for the erection of a hydroelectric generating plant at Mongaup Falls.

The Rathbun & Bird Co., 17 Walker Street, New York, operating a general machine shop, is making inquiries for a vertical milling machine.

The Tunnel Garage, Inc., 3 Charlton Street, New York, has awarded contract to the Ettinger Contracting Co., 44 Court Street, Brooklyn, for a two-story automobile service and repair works, 100 x 200 ft., at 520-28 Broome Street and 55 Thompson Street, to cost about $50,000. G. S. Strivers is president.

The Electric Auto-Lite Co., Poughkeepsie, N. Y., manufacturer of automobile starting and lighting equipment, has been reorganized by Clement O. Miniger and associates,

who recently acquired the local plant, as well as the other factories of the company at Toledo and Fostoria, Ohio. The new company will soon resume operations and has arranged for a bond issue of $3,000,000, a portion of the proceeds to be used for extensions and betterments. Mr. Miniger is president.

The Long Island Railroad Co., Pennsylvania Terminal, New York, is arranging a fund of more than $2,000,000, for extensions and improvements, to include the construction of new power plants, electrical and mechanical equipment purchased, etc. It is proposed to electrify the entire system in the near future. Ralph Peters is president.

The Empire Metal Specialty Co., 327 Sixteenth Street, Brooklyn, is planning for the installation of new equipment to manufacture light metal die products.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until July 25, for a quantity of hacksaw blades for the Navy yards, South Brooklyn, and Philadelphia, as specified in schedule 9646. Also, for 226 ball pein hammers for use at the South Brooklyn yard, and under the same specification, schedule 9649, 840 machine and scaling hammers and copper hammers for Mare Island.

The New York Edison Co., 130 East Fifteenth Street, New York, will commence the immediate erection of a new power house at 19 East Thirty-second Street, to cost about $100,000, including equipment. It is reported to be arranging for the construction of a large generating plant, with cost estimated in excess of $1,200,000.

The Cling Cutlery Corporation, 28 West Forty-fourth Street, New York, has acquired a factory at Welland, Ont., for a new branch plant. It will be operated in the name of its subsidiary organization, the British Empire Cutlery Co.

Motors and other electric power equipment, conveying machinery, etc., will be installed in the new one-story and basement plant, 120 x 200 ft., to be erected at Elmsford, N. Y., by the Horace L. Day Co., 4 White Street, estimated to cost about $250,000.

The Argonaut Service Corporation, New York, has taken title to property on Eleventh Avenue, between Fifty-fifth and Fifty-Sixth streets, and will commence the erection of a six-story automobile service and repair works, estimated to cost about $400,000. Albert Kahn, Marquette Building, Detroit, is architect. Frank J. Davis is president.

The G. A. Schacht Motor Truck Co., Cincinnati, has leased the building at Thirteenth Street and Ely Avenue, Long Island City, recently completed, for an Eastern service and repair works.

Fire, June 24, destroyed one of the buildings at the plant of the Metal & Thermit Corporation, Cornelson Avenue, Jersey City, N. J., with loss estimated in excess of $50,000.

The Arctic Ice Co., Anglesea, N. J., is planning for enlargements in its plant, to include the installation of two 50-ton ice-manufacturing machines, with auxiliary equipment. W. E. Epler is general manager.

A power house will be established in connection with the new five-story addition to be erected by the board of directors, St. Mary's Hospital, Passaic, N. J., estimated to cost about $300,000. Crow, Lewis & Wick, 200 Fifth Avenue, New York, are architects and engineers.

A power house, refrigerating and cold storage plant will be installed in the new building to be erected at 142-50 North Canal Street, Newark, by M. Augenblick & Brother, 16 Commerce Street. It will be two-stories and basement, 80 x 105 ft., and estimated to cost close to $75,000. A one-story machine shop will also be built in connection with a garage for company trucks and cars.

A vocational department will be intalled in the proposed high school to be erected at Maplewood, N. J., by the South Orange, N. J., Board of Education, estimated to cost about $500,000.

The Premier Rubber Co., Newark, N. J., recently organized, has leased buildings at 218-24 New Street, for the establishment of a new plant to manufacture rubber products. Possession will be taken at once and machinery installed. It is proposed to commence operations during August. The company is headed by John W. Stoddard, James A. Whitman and W. Howard Demarest, 790 Broad Street.

The Capital Phonolier Corporation, 54-60 Lafayette Street, New York, is making inquiries for two 18-in. swing engine lathes; two 4-spindle drill presses, size up to ½-in. drill; one emery wheel grinder to take an 8-in. wheel; and one 18-in. band grinder, all motor-driven.

The Board of Trade, Hightstown, N. J., is negotiating with a tool manufacturing company, now located at Newark, N. J., whose name is temporarily withheld, for the erection of a local branch plant. A committee composed of Forman A. Updike, Joseph H. Johnes and William H. Franklin is in charge.

The Wheeling Corrugating Co., 16 Desbrosses Street, New York, a subsidiary of the Whitaker-Glessner Co., has awarded contract to the Foundation Co., 120 Liberty Street, for a six-story factory branch, 120 x 140 ft., on Nelson Avenue, Long Island City.

The International Carbon Corporation, New York, recently organized by officials of the Columbian Carbon Co. and the Atlas Powder Co., 200 Fifth Avenue, New York, has preliminary plans under consideration for the construction of a European plant in France to manufacture special carbon products made from lignite, and similar to its works at Marshall, Tex., recently completed. To carry out the project and for other expansion the company is disposing of a stock issue of $1,210,000.

The Van Dorn Iron Works Co., 318 Broadway, New York, with plants at Cleveland and Long Island City, is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for expansion.

Chicago

CHICAGO, July 3.

No orders have yet been placed against the pending railroad lists, but early action is looked for. It is intimated that one or two roads will purchase only part of the equipment included in their inquiries. The Joliet, Ill., Board of Education has ordered $25,000 worth of machine tools and the Studebaker Corporation, South Bend, Ind., is closing for considerable equipment, one order for grinding machines alone totaling $40,000. The Continental Motors Co., Muskegon, Mich., is buying tools from time to time as required in the development of the Star motor, which it is manufacturing for the Durant Motors Co. Business booked by local dealers during the month of June consisted largely of scattering orders for one or two machines and in the aggregate totaled about same as sales in May. The closing of railroad business which is imminent will mean liberal bookings in July.

The American Tool Works and the Fosdick Machine Tool Co. have both advanced radial drills five per cent. Other radial drill makers are expected to meet these advances and it is expected that other lines of standard machines will be marked up in the near future.

Building permits issued in Chicago in June exceeded all records in number of structures, total frontage and cost. The total cost aggregated $27,500,000 as against $7,484,200 for the same month last year. The permits numbered 1400 and 18,510 ft. of frontage in June, 1921. The record for the first six months of 1922 is also the best in history. Permits numbered 6406, covering 200,058 ft. of frontage and involving $112,000,000, as against 2863 permits, 86,930 ft. and $48,336,950 in the first half of 1921. The best previous record since 1912 was that of the first six months of 1916 with 5551 permits, 176,692 ft. of frontage and $63,078,900. In total cost the first half of this year fell only $12,000,000 behind the total for the twelve months of 1921.

The Indiana Power Co., Vincennes, Ind., is negotiating for the purchase of the power plant and property of the Princeton Light & Power Co., Princeton, Ind. Upon acquisition it will be enlarged and improved. The company is also arranging for the purchase of the power plant at Oakland City, Ind., and will make extensions for service in this district.

The Texas Co. 17 Battery Place, New York, has acquired about 500 acres at Glenrock, Wyo., and will use a portion of the site for a new oil refinery. It will have a capacity of more than 5000 bbl. of crude oil daily, and will include complete by-product operating units for gasoline, naphtha, etc. The plant is estimated to cost in excess of $750,000, including machinery, and it is planned to have the first unit ready for operation in the fall.

The Watson Stabilator Co., Trenton, N. J., has been formed to sell Watson Stabilators in the central New Jersey district. These stabilators are manufactured in Philadelphia by the John Warren Watson Co. and are shipped to the Watson Stabilator Co., Trenton, complete and ready for installing.

E. Edelmann & Co., manufacturers of automobile accessories, have let contract for a two-story plant, 150 x 250 ft., at the southwest corner of Logan Boulevard and Holly Avenue, Chicago, to cost $250,000.

The Kastory Mfg. Co., manufacturer of automobile bodies, La Grange, Ill., has let contract for a one-story plant, 100 x 125 ft., to cost $28,000.

The U. S. Sample Co., printer, 901 South Wells Street, Chicago, has let a contract for a six-story printing plant, 125 x 125 ft., at the southeast corner West Jackson Boulevard and Laflin Street, to cost $350,000.

The Evans L. Reed Mfg. Co., manufacturer of store fixtures and household utensils, Sterling, Ill., will move its plant to Danville, Ill.

The Enterprise Foundry Co., Ft. Wayne, Ind., a recently organized corporation, will open a plant at High and Clark streets soon. A one-story building, 30 x 120 ft., and another two-story structure of the same ground area, have been procured and equipment has been installed. The company will specialize in small gray iron castings.

The Quaker Mill building, near Manchester, Iowa, is being razed by the Iowa Electric Co., preparatory to the erection of an hydroelectric power plant.

The Davis-Watkins Dairymen's Mfg. Co., North Chicago, Ill., manufacturer of dairy supplies, has let contract for a 120 x 160-ft. addition, to cost $80,000.

The Howard Wire Products Co., Terre Haute, Ind., has moved into a new plant on North Waugh Street between Markland Avenue and Harrison Street.

The Ramm & Yahl Brass Foundry Co., Ft. Wayne, Ind., recently organized, will soon start operations in the former plant of the Zimmerman Carpet Cleaning Co., 1911 St. Joe Boulevard. Castings of brass, aluminum, bronze and copper will be manufactured

The Anchor Concrete Mfg. Co., Adrian, Mich., has commenced the construction of an addition which will double its floor space.

Fire, June 21, destroyed a large portion of the plant of the George B. Miller & Son Mfg. Co., Waterloo, Iowa, manufacturer of gasoline engines, tractors, etc., with loss estimated in excess of $500,000, including machinery.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, is planning to rebuild its engine house and shop at West Frankfort, Ill., recently destroyed by fire, with loss estimated at $50,000.

The Benjamin Electric Mfg. Co., 806 West Washington Boulevard, Chicago, manufacturer of electrical specialties, is disposing of a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements. R. B. Benjamin is president.

The Minnesota Utilities Co., Eveleth, Minn., has plans in progress for the construction of a hydroelectric generating plant on Falls Lake, near Ely, Minn., with initial capacity of about 12,000 hp., estimated to cost about $1,750,000. R. M. Hesketh is secretary.

The Service Rubber Co., 401 Central Trust Building, Rock Island, Ill., is taking bids for a new three-story plant, 60 x 200 ft., estimated to cost about $100,000. Carrin & Horn, 311 Safety Building, are architects. J. T. Crowley heads the company.

The United Light & Railways Co., Davenport, Iowa, is arranging for a preferred stock issue of $20,000,000, a portion of the proceeds to be used for extensions and improvements.

A vocational department will be installed in the new two-story and basement high school to be erected at Charlton, Iowa, ground for which will be broken at once. William Gordon, Hubbell Building, Des Moines, Iowa, is architect.

The Danville, Champaign & Decatur Railway & Light Co., Danville, Ill., is disposing of a bond issue of $1,000,000, a portion of the proceeds to be used for extensions and improvements.

The American Steel & Wire Co., Denver, Col., has plans under way for the erection of a new building in the vicinity of its works, estimated to cost about $500,000.

The State Board of Control, St. Paul, Minn., will install an electric crane, air compressors and other mechanical equipment in the new mines experiment station at the State university.

The Climax Ice Cream Co., Producers' Dairy and Corbett Dairy Co., Denver, Col., recently affiliated, will install a cold storage plant in connection with a new creamery and dairy plant, estimated to cost about $300,000, including equipment.

The Biflex Products Co., North Chicago Ill., manufacturer of automobile bumpers, has taken title to property adjoining its plant, consisting of a foundry building and land for further expansion. The addition will be used at once for the manufacture of double-barbumpers and it is expected to increase the output more than 100 per cent. The plant area now approximates 5 acres.

The Commonwealth Edison Co., 72 West Adams Street, Chicago, will soon take bids for a new one-story power house, 78 x 100 ft., at 707-15 South La Salle Street.

The J. L. Clark Mfg. Co., Rockford, Ill., manufacturer of metal cans and containers, will commence the erection of a one-story addition, 60 x 190 ft.

Toth & Co., 1301 Larabee Street, Chicago, are arranging for the installation of machine tools, dies and other equipment at their machine shop.

Philadelphia

PHILADELPHIA, July 3

The James H. Billington Co., 113 Chestnut Street, Philadelphia, manufacturer of textile mill equipment and supplies, has filed plans for a new machine shop at 1528-48 North Fifth Street, to cost about $40,000.

Frederick W. Hosbach, 2415 South Street, Philadelphia, will build a new two-story wood-working plant, 64 x 76 ft., at Twelfth and Brown streets, to include machine shop and other mechanical departments. Henry P. Schneider, 2713 York Road, is architect.

Fire, June 25, destroyed the tankage department at the plant of the Pennsylvania Synthetic Gas & Chemical Co., Sixty-third Street, with loss reported at close to $25,000.

Thomas Savill's Sons, 1310 Wallace Street, Philadelphia, manufacturers of pipe, plumbing equipment, etc., have awarded contract to Seeds & Steinmetz, 1101 Divinity Place, for a two-story foundry, 42 x 60 ft., at 635-7 North Watts Street. H. B. Waldon, 10 South Eighteenth Street is architect.

The N. & G. Taylor Co., 300 Chestnut Street, Philadelphia, has awarded contract to the Belmont Iron Works, Twenty-second Street and Washington Avenue, for a one-story foundry, 50 x 90 ft., and one-story general manufacturing building, about 75 x 140 ft., at Cumberland, Md.

The American Motor Body Co., Eighteenth and Lehigh Streets, Philadelphia, operated by the Hale & Kilburn Co., is arranging for increased production, following the receipt of a contract from the Durant Motors, Inc., New York, for 50,000 car bodies.

T. R. Martindale, Broad Street and Allegheny Avenue, Philadelphia, has awarded contract to the Bowden Construction Co., 1935 Chestnut Street, for a two-story automobile service and repair building, 100 x 265 ft., estimated to cost approximately $100,000.

The Philadelphia Paper Mfg. Co., River Road, Philadelphia, is said to be arranging for the early purchase of cranes and conveying machinery for installation at its new building at Nixon and Fountain streets, now in course of erection. It has also filed plans for improvement in its present building at this location.

W. D. Warren, Mt. Holly, N. J., has awarded a contract to McCloskey & Co., 1620 Thompson Street, Philadelphia, for a one-story automobile service building, with machine repair department, 40 x 100 ft., estimated to cost approximately $55,000. Folsom & Stanton, Fuller Building, Philadelphia, are architects.

A one-story machine repair shop, 48 x 60 ft., will be constructed by the Lebanon Silk Co., Lebanon, Pa.

The Rowe-Stuart Motors Corporation, Lancaster, Pa., has plans nearing completion for a new plant, 270 x 325 ft., on Fountain Avenue, for the manufacture of motor truck equipment.

August N. C. Madsen, Harrisburg, Pa., operating a concrete block manufacturing plant at Nineteenth and Pemberton streets, has tentative plans under consideration for enlargements to increase the output from 1500 to 3600 blocks per day. Automatic machinery will be used for production.

A vocational department will be installed in the two-story and basement high school, 140 x 180 ft., to be erected at Leechburg, Pa., estimated to cost about $250,000. W. G. Eckles, Lawrence County Bank Building, New Castle, Pa., is architect.

The Womelsdorf Electric Co., Womelsdorf, Pa., recently organized by officials of the Berkshire Electric Co., 50 North Duke Street, Lancaster, Pa., is considering extensions and improvements in the municipal power plant, just acquired. In the future it will be operated as a private enterprise.

The Blue Mountain Electric Co., Millersburg, Pa., is planning the construction of a new hydroelectric power plant on local site, recently acquired.

J. K. Wetzel & Sons, Shamokin, Pa., will commence the immediate erection of a two-story automobile service and repair works, 80 x 100 ft. William H. Lee, 32 South Seventeenth Street, is architect.

James J. H. McNally and A. W. Grant, Harrison Building, Philadelphia, have commissioned N. W. Akimoff, same address, mechanical engineer, to prepare plans for new works at Fourth, Sixth and Water streets, Camden, N. J., to manufacture American Diesel engines, to be one and two stories, 100 x 500 ft., estimated to cost close to $500,000, with machinery. The city will vacate a number of streets at the site, and a bond of $25,000 has been posted to insure the construction. A company is being organized to build and operate the plant.

The Cumberland Valley Light & Power Co., Harrisburg, Pa., has arranged for a bond issue of $40,000 for extensions and improvements.

A vocational department will be installed in the two-story and basement high school, 130 x 150 ft., to be erected at Dunlo, Pa., estimated to cost about $100,000. W. C. Ackles, Lawrence County Bank Building, New Castle, Pa., is architect.

The Jones Machine Works, Fifty-third Street and Lansdowne Avenue, Philadelphia, is said to be arranging a list of equipment for installation at its proposed new machine shop at Primos, Pa., estimated to cost about $50,000.

Motors, conveying apparatus and other mechanical and electrical equipment will be installed in the addition to be constructed by the Blumenthal Brothers Co., Margaret and James streets, Philadelphia, estimated to cost about $175,000. The Ballinger Co., Twelfth and Chestnut streets, is architect.

Motors, controlling devices and other electrical and mechanical equipment, will be installed in the new two-story printing plant to be constructed on Main Street, Washington, Pa., by the Observer Publishing Co., estimated to cost about $150,000.

A vocational department will be installed in the new two-story high school to be constructed at Throop, Pa. estimated to cost about $170,000. John J. Howley, Traders' Bank Building, Scranton, Pa., is architect.

The Bethlehem Foundry & Machine Co., Front Street, Bethlehem, Pa., has acquired the plant and business of the Wedge Mechanical Furnace Co., Greenwich Point, Philadelphia. It includes patents for the furnaces manufactured for mining service, and the new purchaser will remove this branch of the business to its works at Bethlehem.

Detroit

DETROIT, July 3.

The Motor Wheel Corporation, 701 East Saginaw street, Lansing, Mich., has awarded contract to the H. G. Christman Co., Lansing, for two additions, each one-story, 120 x 400 ft., and 120 x 240 ft., respectively. The larger structure will be used for the manufacture of wire wheels, etc., and the other building for gear production. M. E. Harper is president and general manager.

The Ryan Foundry Co., Lansing, Mich., will develop maximum capacity at its plant at once. A contract has been secured from the Grant Motor Co., Cleveland, for castings for 100,000 automobile engines.

The Common Council, North Muskegon, Mich., will install an electrically operated pumping plant in connection with its proposed new waterworks, estimated to cost about $300,000.

The Michigan Gas & Electric Co., Ishpeming, Mich., has plans nearing completion for a new electric generating plant at Three Rivers, Mich., estimated to cost in excess of $100,000. An addition will also be erected to the present plant at Constantine, Mich., to cost about $40,000.

The Gibson Refrigerator Co., Greenville, Mich., manufacturer of refrigerators and refrigerating equipment, has awarded contract to J. Herrmann & Son, Perkins Building, Grand Rapids, for a four-story addition.

The Whitcomb Hotel Co., St. Joseph, Mich., has plans under way for a new power house. Cahill & Douglas, 217 West Water Street, Milwaukee, Wis., are engineers.

The Detroit Steam Motor Corporation, 38 Hendrie Street, Detroit, manufacturer of steam-driven automobiles, has tentative plans under way for the establishment of a branch plant at Windsor, Ont., to be operated under the name of the Windsor Steam Motors, Ltd.

The Bay City Freezer Co., Bay City, Mich., has completed plans for a new one and three-story ice-manufacturing plant.

The Morse Chain Co., Ithaca, N. Y., manufacturer of silent chain transmissions, has preliminary plans for a new branch factory at Detroit, and has secured a site on the Detroit Terminal Railway line, near Warren Avenue. It will be of reinforced concrete and will approximate 60,000 sq. ft. of area.

The Hayes Wheel Co., Jackson, Mich., is disposing of a stock issue of $825,000, a portion of the proceeds to be used for extensions. It operates branch plants at Albion, Mich., and Anderson, Ind., with total production of about 16,000 automobile wheels daily.

The Wilson Foundry & Machine Co., Pontiac, Mich., a subsidiary of the Willys-Overland Co., Toledo, Ohio, is arranging for immediate increase in the manufacture of Willys-Knight motors. A portion of the No. 3 plant of the company will be used for this purpose, and it is proposed to double, approximately, the present output.

The Cadillac Malleable Iron Co., Cadillac, Mich., was incorporated recently with capital stock of $350,000 to manufacture malleable iron castings and related products. The malleable castings produced at this plant will be made exclusively of charcoal iron. Officers of the company are: J. C. Ford, president; C. T. Mitchell, vice-president; R. J. Teetor, secretary and general manager; George G. Brown, treasurer. Construction of the plant was begun in 1921, but work was delayed and the plant is now being completed. Equipment is being installed and manufacturing operations will begin late in the summer. The Foundry Equipment Co., Cleveland, will install the core ovens; Holcroft & Co., Detroit, will put in the air furnace; steel work was fabricated and erected by the Indiana Bridge Co., Muncie, Ind., steel sash being furnished by the Detroit Steel Products Co., Detroit.

The Furnace Fan Co., capital $50,000 preferred and 150,000 shares no par value common stock, has been formed to manufacture appliances used in connection with hot air systems. An option has been secured on a vacant plant at Dowagiac, Mich. The incorporators are: N. B. Wales, Kalamazoo; Dr. F. N. Bonine, Niles, and Marinus Vander-Maas, Plainwell.

The C. G. Spring Co., Kalamazoo, has purchased the machinery and plating plant of the Shakespeare Products Co. and will operate it in the future.

Milwaukee

MILWAUKEE, Wis., July 3.

It is stated by sales directors of large machine-tool manufacturing concerns in this market that more real progress was made in sales and production in June than in any month in nearly two years, while at the close, the prospects were much more favorable as well. The outlook embraces genuine hope of a renewal of demand from railroad sources, despite their labor difficulties. The buying of tools by automotive shops is well sustained. Manufacturers of milling machines report increasing patronage and active inquiry, which in the last four to six weeks enabled them to advance production schedules to some extent, although the rate of operations still is unsatisfactory from the standpoint of profitable operation. In the local tool trade there is no expectancy of a sudden demand, but hope is well grounded that the improvement noticeable in the last 60 days will continue. This view is supported by the steadily growing scope of foundry operations and the new construction movement, especially in metal-working industries.

The Bahde Mfg. Co., 2621 Vine Street, Milwaukee, a new corporation organized to do a general jobbing machine shop business, has engaged Leiser & Holst, 105 Wells Street, to design a one-story brick and steel shop, 30 x 150 ft., to be erected at Thirtieth and Chambers streets. A miscellaneous list of equipment for toolroom and production purposes will be purchased at once. Carl A. H. Bahde is president and general manager.

The Middle West Mfg. Co., Beaver Dam, Wis., has been incorporated with an initial capitalization of $30,000 to manufacture farm tools, barn equipment, steel dairy fixtures, etc. It plans to take over an existing plant, but details have not been given out. The incorporators are C. A. Friday, W. R. Zimmerman and M. B. Bulger.

The West Bend Aluminum Co., West Bend, Wis., manufacturer of aluminum stampings, drawn-ware, novelties, etc., is undertaking an important steam power plant enlargement project, involving the purchase of additional boilers, generators, two new steel stacks and other equipment. The work is in charge of the Federal Engineering Co., 444 Milwaukee Street, Milwaukee.

The Willow River Power Co., Hudson, Wis., is a new $500,000 corporation chartered in Wisconsin to build, maintain and develop water powers and steam generating plants and distributing and transmission systems. It is hoped to start work this year on an extensive water power development project on the St. Croix River and Willow River branch. Tentative specifications are under consideration. The principals in the enterprise are F. P. Buckhardt, A. P. Schultz and B. A. Buckhardt, of Hudson.

The Pawling & Harnischfeger Co., Milwaukee, has taken an order for one 10-ton electric traveling crane for the new plant which is being erected by the Claybourn Process Corporation, formerly of Menasha, Wis., at Humboldt Avenue and Franklin Street, in Milwaukee, at a cost of $500,000 Herman J. Esser, Camp Building, Milwaukee, is supervising architect.

The Board of Education, Stevens Point, Wis., has let the general contract to the Immel Construction Co., Fond du Lac, Wis., for a new high school with manual training departments, estimated to cost $250,000. Vocational equipment will not be purchased until early in the fall. Robert A. Messmer & Bro., Majestic Building, Milwaukee, are the architects.

The Wisconsin Valley Electric Co., Wausau, Wis., has purchased the entire holdings of the Tomahawk, Wis., Light, Telephone & Improvement Co., taking possession July 1. The new owner plans to develop a 67-ft. head at Grandfather Dam, the highest waterfall on the Wisconsin River, between Tomahawk and Merrill, at an estimated cost of $200,000. Specifications are now in preparation.

The Milwaukee Vending Machine & Mfg. Co., Milwaukee, has been incorporated with a capital stock of $25,000 to manufacture special devices and appliances. A plant has been acquired at 1261 Kinnickinnic Avenue and is now being equipped. The principals are William O'Brien, 966 Mound Street; Robert W. McCormick, and Robert F. Downey, 391 Pryor Avenue, local.

Henry Behrens and Ervin H. Stibbe, Peshtigo, Wis., conducting a machine shop and garage, are organizing a new corporation to engage in quantity production of a line of special automotive service shop tools designed and patented by Mr. Behrens, principally an engine stand and bearing tool.

The Lusk Light & Power Co. of Lusk, Wis., has been incorporated with a capital stock of $25,000 to build and operate hydroelectric generating plants and generally furnish electric current for light and power purposes. The incorporators are P. M., A. K. and O. L. Pederson, all of Lusk.

The E. J. Pfiffner Lumber Co., Stevens Point, Wis., has plans for a two-story brick and concrete planing mill, 60 x 110 ft., which will require a full complement of new machinery with individual electric motor drive. The architect is Frank Spalenka, Stevens Point.

The Bukolt Mfg. Co., Stevens Point, Wis., manufacturer of automotive specialties and steel-shod tire protecting devices, is making inquiry for additional miscellaneous equipment to handle a 10-year contract for tire protectors from the Atlantic Coast Auto Exchange, Inc., Baltimore, Md., representing $100,000 a year. John J. Bukolt is president and general manager.

The Menasha Machinery Mfg. Co., Menasha, Wis., has filed a notice of dissolution. The interests of the concern have been embodied in the Claybourn Process Corporation, which is now erecting a $500,000 plant in Milwaukee equipped for manufacturing multi-color printing presses. L. W. Claybourn, president of the dissolved concern, is president and general manager of the new corporation.

The Northwest Engineering Works Co., Green Bay, Wis., is increasing its output of crawler type traveling cranes and hoists from two a week to four and is planning to place its plant on a 24-hr. schedule to meet demands from all sections of the United States.

The Wisconsin Power, Light & Heat Co., Madison, Wis., which is engaged in a plant enlargement program involving an additional investment of about $750,000, has recently increased its authorized capitalization from $2,000,000 to $3,000,000, the new issues consisting of $1,000,000 common and $2,000,000 preferred stock.

The Gulf States

BIRMINGHAM, July 3.

The Wright Steam Motor Co., J. B. Wright, president and general manager, Baton Rouge, La., has plans under way for new works to manufacture steam-operated engines for automotive service, comprising a main building 100 x 150 ft., with smaller structures. A list of equipment is being arranged.

The oil refinery of the Beaver Electra Refining Co., Electra, Tex., has been acquired by D. E. DeCourse, Devol, Okla., and associates. A company will be formed to operate the plant at an early date. A number of extensions and improvements will be made.

James E. Taylor, Cleburne, Tex., is organizing a company to construct and operate a local electric power plant. It is said that the plant will cost about $50,000.

The Common Council Homestead, Fla., has advanced the date for bids for equipment for its municipal electric power until July 28. The apparatus will include two complete turbo-generator sets, each 300 kw., three phase, 60 cycle, 2300 volts; two boilers, each 150 to 200-hp.; one 10-panel switchboard, and one 10-ton traveling crane. B. M. Duncan is engineer; R. E. Edwards is town clerk.

The Ford Motor Co., Highland Park, Mich., will take bids at once for a new one and two-story assembling plant on property recently acquired at New Orleans, 430 x 460 ft., on North Peters Street. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

J. D. Ford, Bristow, Okla., is organizing a company to construct and operate a new oil refinery in the vicinity of Cross Plains, Tex.

The Edwards Wheel & Body Co., 204 Washington Street, Dallas, Tex., has filed plans for a new one-story plant.

The Nueces County Water Improvement District Commissioners, No. 3, Robstown, Tex., will erect an electrically operated pumping plant in connection with an irrigation project in the north central section of the county. It will have a capacity of about 18,000 gal. per min.

Plans are being perfected for the reorganization of the Louisiana Motor Car Co., Cedar Grove, La., and it is expected to begin operations at an early date. Improvements will be made and new equipment installed. The reorganization is being carried out under the direction of the Commercial National Bank, which recently acquired the physical properties of the company.

The Pine City Property Owners, Progressive Association, Pine City, Fla., has preliminary plans in progress for a municipal electric light and power plant. J. A. Monney is secretary.

The Jahncke Dry Docks, Inc., New Orleans, La., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions, improvements, etc. Ernest L. Jahncke is president.

The West Florida Power Co., Tallahassee, Fla., recently organized with a capital of $1,000,000, is perfecting plans for a new hydroelectric generating plant on the Ocklocknee River, including transmission system, estimated to cost in excess of $400,000. B. H. Hardaway, Sr. and Jr., head the company.

Fire, June 23, destroyed a portion of the plant of the Lee Lumber Co., Alexandria, La., including saw mill, with loss estimated at about $100,000, including machinery. It is proposed to rebuild at an early date.

The Texas Boiler Works, 3214 Hickory Street, Dallas, Tex., has arranged for the establishment of a department for the repair and overhauling of railroad tank cars.

The Western Compress & Storage Co., Abilene, Tex., is planning the erection of a series of branch cotton compress and storage plants at McKinney, Hamlin, Sweetwater and Slaton, Tex., estimated to cost about $80,000, including equipment.

The Bennett Motor Co., Breckenridge, Tex., has leased a two-story building, 100 x 150 ft., to be erected on local site, for the establishment of a new service and repair works. It will cost close to $50,000.

Fire, June 23, destroyed a portion of the plant of the Stamford Cotton Oil Co., Stamford, Tex., with loss estimated at about $40,000, including equipment.

The Central South

ST. LOUIS, July 3.

The Huntzinger Advertising & Mfg. Co., 909 Baltimore Avenue, Kansas City, Mo., manufacturer of metal novelties, has awarded contract to the Pratt-Thompson Construction Co., 505 Republic Building, for a new six-story and basement plant, 30 x 140 ft., at 108 West Tenth Street, estimated to cost $110,000, including equipment. The Reyburn Engineering Co., 609 Weldheim Building, is engineer.

E. J. Robinson, Cheney, Kan., is arranging a list of equipment for installation in a machine shop for automobile repairs and other work.

The Farris Hardwood Lumber Co., Nashville, Tenn., is planning to rebuild the portion of its saw mill, recently destroyed by fire, with loss estimated at close to $45,000.

The Mississippi River Commission, First and Second districts, Custom House, Memphis, Tenn., will receive bids until July 15, for one marine type refrigerating and ice-making plant.

The Duncan Machinery Co., 721 North Central Avenue, Knoxville, Tenn., machinery dealer, is making inquiries for locomotive type boilers and other power equipment.

Electric equipment, hoisting machinery, power equipment, conveying apparatus will be installed in the new elevator to be constructed by the Victory Mill & Elevator Co., Wichita, Kan. T. F. Dawkins is secretary.

A vocational department will be installed in the new high school to be erected at Mount Pleasant, Tenn., estimated to cost about $75,000, revised plans for which have been prepared by George Waller, architect, Independent Life Building, Nashville, Tenn.

The Oklahoma General Power Co., Muskogee, Okla., has plans under way for the erection of a new electric power plant with initial capacity of about 10,000 hp.

The Goodwin-Field Motor Car Co., 250 East Main Street, Lexington, Ky., has plans nearing completion for a new one-story service and repair works, 100 x 200 ft.

The Gary Eagle Marble Mills, Knoxville, Tenn., operated by the Gray Eagle Quarries, will commence the construction of a new one-story plant, 125 x 160 ft., to be equipped for cutting, finishing, polishing and kindred operations. It is estimated to cost close to $40,000, including equipment. Charles L. Lawton is architect in charge.

The Wichita Key & Novelty Co., 132 North Topeka Avenue, Wichita, Kan., is planning for the installation of a number of machine tools and other equipment.

The Associated Gas & Electric Co., operating the Kentucky Public Service Co., Bowling Green, Ky., and other electric power organizations, has arranged for a preferred

stock issue of $270,000, a portion of the proceeds to be used for extensions and improvements.

The Motor-Q Battery Co., 1619 East Douglas Avenue, Wichita, Kan., is planning for the installation of machine tools and other equipment. J. W. Martin heads the company.

The Board of Administration, State Penitentiary, Lansing, Kan., will build a new power house at the institution. James A. Kimball, State House, Topeka, Kan., is business manager in charge.

The Dixie Power Co., Memphis, Tenn., has plans under way for a hydroelectric generating plant on the White River, estimated to cost in excess of $750,000, including machinery and transmission system.

The Hermitage Portland Cement Co., 174 Third Avenue, North, Nashville, Tenn., has work under way on its mill at Old Hickory, and is receiving bids for the machinery installation. A power house will be established in connection with the new plant, which is estimated to cost approximately $1,000,000. R. T. Miller is secretary.

The Saline River Hardwood Co., Pine Bluff, Ark., has plans under way for extensions and improvements in its plant to cost about $100,000. New machinery will be installed.

An electric power house will be installed in the new plant to be established by the Silk Tie Knitting Co., Knoxville, Tenn., recently organized. V. H. Spruill is president.

The Success Specialty Co., P. O. Box 102, Bells, Tenn., is making inquiries for a quantity of wood-working machinery, electric motors and other power apparatus.

The Ozark Creamery Co., Neosho, Mo., is planning for the installation of new refrigerating machinery at its ice-manufacturing and cold storage plant.

Indiana

INDIANAPOLIS, July 3.

The Chapman Price Steel Co., Shelby Street, Indianapolis, is preparing plans for an addition to its plant, forming a complete operating unit, estimated to cost about $500,000, including machinery. Lief Lee, Frick Building, Youngstown, Ohio, is engineer. Niles Chapman is president.

Joseph Entwhistle, Terre Haute, Ind., has leased the plant of the Terre Haute Vitrified Brick Co., St. Mary's, recently purchased by Charles Minshall. It will be remodeled for the manufacture of face brick instead of paving brick, as heretofore.

The Rockford Mfg. Co., 2001 English Avenue, Indianapolis, manufacturer of transmission pulleys, etc., has awarded contract to the Builders' Construction Co., 840 North Meridian Street, for a new one-story machine shop, estimated to cost about $40,000.

George Raub, Logansport, Ind., has acquired property on Broadway as a site for a new two-story automobile service building, including machine repair shop.

A vocational department will be installed in the new two-story and basement East Side high school to be erected at Evansville, Ind., estimated to cost about $300,000, including equipment. J. C. Llewellyn, 38 South Dearborn Street, Chicago, is architect.

The Studebaker Corporation, South Bend, Ind., has laid foundations for five new buildings, comprising a four-story structure, 100 x 600 ft.; a one-story shop, 50 x 96 ft.; a two-story shop, 72 x 156 ft.; one-story car loading and car storage building, and a one-story power house addition, 50 x 50 ft. The extensions will cost in excess of $500,000. Albert Kahn, 1000 Marquette Building, Detroit, is architect.

W. J. Holliday & Co., Indianapolis, manufacturers of iron and steel products, has acquired for future expansion, through its subsidiary organization, the J. S. Holliday Realty Co., property at 110-16 South Meridian Street, 48 x 195 ft., improved with a machine shop and adjoining building.

The Calumet Tank & Mfg. Co., Hammond, Ind., will commence the erection of a new one-story foundry, 60 x 130 ft. on Industrial Road, estimated to cost about $75,000.

Buffalo

BUFFALO, July 3.

The Ulrich Plan File Co., 516 West Fourth Street, Jamestown, N. Y., is planning for the erection of a new factory, estimated to cost close to 25,000.

The Romer Axe & Tool Co., 805 Main Street, Dunkirk, N. Y., will install electric motors and other electrical equipment at its plant.

The plant and property of the Parenti Motors Corporation, Buffalo, bankrupt, is being purchased by the Hanover Mfg. Co., from the Marine Trust Co., trustee, for about $225,000. The new owner will take immediate possession and will install machinery for the manufacture of a small automobile, two-cylinder, air-cooled motor, designed to take the place of motorcycles.

A vocational department will be installed in the new two-story high school, 50 x 130 ft., to be erected at Clarence, N. Y. Herbert C. Swain, 52 West Chippewa Street, Buffalo, is architect.

The Mancusco & Son Co., 322 Elliott Street, Batavia, N. Y., has plans for a two-story automobile service and repair building, 81 x 100 ft., on East Main Street, estimated to cost close to $50,000.

The Eberhardt Steel Products Co., 43 Chelsea Street, Buffalo, is planning for the installation of forge shop equipment in an extension.

The Niagara Gorge Power Co., Niagara Falls, N. Y., has tentative plans under consideration for a new hydroelectric generating plant on the lower Niagara River.

A vocational department will be installed in the new three-story high school, 180 x 275 ft., to be erected at Pine Avenue and Portage Road, Niagara Falls, N. Y., estimated to cost $450,000. It will replace a building recently destroyed by fire. The Associated Architects of Niagara Falls, Inc., Niagara and Third Streets, is architect.

The Allen Mfg. & Welding Corporation, 163 Adams Street, Buffalo, is arranging a list of equipment for installation at its new plant on Washington Street.

Pittsburgh

PITTSBURGH, July 3.

Business in machinery and equipment in June in this district has fallen short of the expectations created by the good showing of the previous month. Inquiries have not fallen away materially, but for some reason, presumably to get the benefit of freight rate reductions, effective July 1, or because of the uncertainty caused by the coal strike and the threat of labor troubles on the railroads, growing out of the wage reduction which went into effect Saturday, buyers have been extremely cautious in the matter of placing orders. No general lists of machine tools lately have appeared and while the day to day busines reaches a fairly satisfactory aggregate, it is not as pleasing to the trade as would be individual orders calling for several tools.

The crane market still shows a fair degree of activity. The Pittsburgh Plate Glass Co., Ford City, Pa., has placed an order for two 5-ton, 100-ft. span Shaw cranes, while the Morgan Engineering Works, Alliance, Ohio, has taken an additional 75-ton ladle crane and a 25-ton standard crane for the Steubenville works of the Wheeling Steel Corporation. The Alliance Machine Co., Alliance, Ohio, has been awarded four cranes by the Weldless Tube Co., Wooster, Ohio. Formal inquiry for 35 to 40 cranes for the new plant of the National Tube Co., Gary, Ind., is likely to go out soon. Engineering plans are completed and excavation and grading work is expected to start in the near future. The company itself probably will make most of pipe-bending, straightening and other machinery for this plant.

The Youngstown Steel Co., Youngstown, Ohio, H. Z. Bixler, Youngstown, chief engineer, recently broke ground for a new plant and has placed the order for a muck bar mill with the United Engineering & Foundry Co. This company will engage in wrought iron made in mechanical puddlers. The General Electric Co. has taken the order for a 1000-kw. turbo-alternator unit, three-phase, 60-cycle, 2300 volts, with exciter and switchboard complete, for the Preston County Coke Co., Morgantown, W. Va. The condenser to go with the alternator has been placed with the Wheeler Condenser & Engineering Co., Carteret, N. J.

The Star Ornamental Iron & Works Co., 3625 Frazier Street, Pittsburgh, is planning for the installation of additional equipment.

The Clarion River Power Co., Johnstown, Pa., affiliated with the Penn Public Service Co., with headquarters at the same place, is perfecting plans for the first of three new hydro-electric generating plants at Piney Creek, Clarion River. It will have an initial capacity of 22,000 hp., and is estimated to cost about $3,000,000. The company has two other sites on the same river, and will develop these later. A bond issue of $2,700,000 is being sold to be used in connection with immediate construction. F. T. Hepburn is president of both companies.

A vocational department will be installed in the two-story and basement high school addition to be erected at McKeesport, Pa., estimated to cost about $300,000. T. B. and Lawrence Wolfe, Century Building, Pittsburgh, are architects. Inquiries are being made for machine tools and other equipment.

Ovens and power equipment, electrical apparatus, conveying machinery, etc., will be installed in the new three-story baking plant to be erected at New Kensington, Pa., 80 x 100 ft., by the Premier Baking Co., an interest of the Fayette Baking Co., Connellsville, Pa., estimated to cost about $100,000, including equipment. B. H. Prack, Keystone Building, Pittsburgh, is architect.

The Blystone Mfg. Co., Cambridge Springs, Pa., manu-

facturer of concrete products, etc., is planning for a one-story works, 90 x 400 ft., and a two-story structure, 40 x 95 ft., to replace buildings recently destroyed by fire.

The Stonecrete Corporation, 6023 Penn Avenue, Pittsburgh, Pa., will install a quantity of used machinery, including lathes, drill press, shaper, boring mill, punch and shear, etc. Inquiries are being made.

Cunningham, Miller & Enslow, Huntington, W. Va., will install conveying and other equipment at their coal properties, at Kistler, W. Va., to cost about $25,000.

In connection with extensions and the installation of new equipment at the municipal waterworks, Fairmont, W. Va., bids for which will be received until July 10, quotations are also being asked for an electrically-operated hoist for handling screens. Fuller & McClintock, 170 Broadway, New York, are consulting engineers.

The Spencer Coal Co., Whitby, W. Va., is planning for the installation of new electrical equipment and other machinery. It has arranged for a change of name to the Bowyer Smokeless Coal Co W. H. Ruby heads the company.

The Hardy Coal Co., Huntington, W. Va., has plans under way for the installation of electrical machinery and other equipment on property recently acquired in McDowell County. Paul Hardy is president.

The Manown Mfg. Co., Oliver Building, Pittsburgh, manufacturer of firebrick, is about to begin the erection of a new plant.

A vocational department will be installed in the new high school to be erected at Sewickley, Pa., estimated to cost about $250,000. Press C. Dowler, Magee Building, Pittsburgh, is architect.

The Lakeside Refining Co., Franklin, Pa., is planning for extensions and improvements in its oil refinery, comprising the former plant of the Foco Oil Co., recently acquired, estimated to cost about $55,000.

The H. M. Crawford Coal Co., Grafton, W. Va., is considering rebuilding the tipple at its properties, destroyed by fire June 27.

B. L. Bailey, Bluefield, W. Va., has awarded a contract to the W. T. Owen Co., Earle Avenue, for a new four-story automobile service and repair works, 83 x 120 ft., estimated to cost about $50,000.

The Hall & Thomas Co., 45 Hilton Street, Bradford, Pa., manufacturer of cement and concrete products, is planning for the installation of new equipment. B. F. Hall heads the company.

The Island Creek Coal Co., Holden, W. Va., will soon arrange for the equipment installation in its new machine shop, plans for which are under way. The structure will replace a works recently destroyed by fire with loss of about $75,000.

New England

BOSTON, July 3.

May was one of the most unprofitable months experienced by the New England machine tool trade in several years, and June was not appreciably better, according to a majority of dealers. In the closing days of June, however, there were tangible indications of a turn for the better. Prospects, which in the aggregate amount to a considerable investment by customers, believed by the machine tool trade to have passed beyond the active stage, are again showing life. The renewed activity generally is ascribed to a growing belief among users that the price situation is stronger and that the machine tool market has passed its extreme low point of depression. Substantiating this is the announcement during the past week of advances on some sizes of turret machines amounting to 10 per cent, and on small radial drills about 7½ per cent. These follow closely on advances in standard lathes. In addition, the inclination to cut prices on planers is less noticeable.

Business the past week was interrupted by holidays. Virtually all Boston machine tool houses closed from Saturday to Wednesday. Previous to Saturday, however, sales of new machines again exceeded those of used machinery, but the largest single transaction was six specially designed profilers, purchased by a Massachusetts textile machinery manufacturer. Sales of new tools otherwise were of one or two machines in individual cases and include a No. 3 Universal milling machine to a Connecticut concern; hoist equipment having 4000 lb. capacity to a Massachusetts textile machinery maker; a 1 x 15-in. turret lathe to a Worcester screw manufacturer; numerous bench drills to radio manufacturers and machine shops engaged on special work, and hand screw machines to local and out of town machine shops. Inquiries for used equipment are coming from New York, Pennsylvania and New Jersey, as well as from various New England points. In connection with radio appliances, it is interesting to note that manufacturers are quoting twelve and thirteen months' deliveries.

The demand for small tools continues active. June bookings by the leading machine tool houses were fully up to those of May, which was an exceptionally good month. The call for machine parts is less active, however. Some sizes of motors are difficult to obtain.

The J. T. Robertson Co., soap, Manchester, Conn., is to construct a $100,000 plant, two stories, 60 x 150 feet.

The Kenney Electric Co., New London, Conn., capitalized for $300,000, has been incorporated to manufacture electric safety razors. It will begin business with $150,000. The incorporators are C. H. Kenney, William Weiner, Richard Hendel, Joseph Swartz and George Packer.

Considerable damage was done to the floating machine shop owned by Howard & Horne, Portland, Me., when it capsized last week. Heavy machinery and tools probably will be a total loss.

The Stafford Co., Readville, Mass., textile machinery, has sold $550,000 8 per cent cumulative preferred stock. Funds derived from this sale will be used to pay off floating indebtedness, provide additional working capital and the purchase of equipment and material.

The MacKenzie Co., P. O. Box 432, Westerly, R. I., manufacturer of textile machinery, is considering the installation of spinning frame equipment and other machinery.

The Bantam Ball Bearing Co., Bantam, Conn., has taken bids for an addition to its plant at Litchfield, Conn., to cost about $150,000, including equipment. The Fletcher-Thompson Co., Fairfield Avenue, Bridgeport, Conn., is architect.

The Carroll Wire Co., Huntington Avenue and East Aurora Street, Waterbury, Conn., recently incorporated, has elected the following officers: P. H. Carroll, president; V. J. Carroll, vice-president and treasurer; F. W. Carroll, secretary and assistant treasurer. It will operate a plant at the above address.

The Maine & New Brunswick Power Co., Presque Isle, Me., will make enlargements and improvements in its power plant. New equipment will be installed. A. R. Gould is general manager.

S. J. Cardner, 32 Taylor Street, Springfield, Mass., will commence the immediate erection of a new one-story automobile service building, 55 x 220 ft., with machine repair shop, at 162 North Main Street. C. C. West, 25 Harrison Avenue, is architect.

The American Electric Service & Maintenance Co., Springfield, Mass., will use its new building, recently completed, for a complete line of repair work for electric power equipment, including motor rebuilding, transformer rewinding, etc.

The Worcester Cold Storage & Warehouse Co., 284 Franklin Street, Worcester, Mass., will build an addition to its cold storage plant, to cost close to $40,000.

A vocational department will be installed in the three-story high school to be constructed on Commercial Street, Adams, Mass., estimated to cost $350,000. The Frank Irving Cooper Corporation, 33 Cornhill Street, Boston, is architect.

Fire, June 25, destroyed a portion of the plant of the American Powder Co., South Acton, Mass., with loss approximating $100,000.

A one-story power house will be erected by the Sturdy Memorial Hospital, Attleboro, Mass. Kendall, Taylor & Co., 142 Berkeley Street, Boston, are architects: R. D. Kimball Co., 6 Beacon Street, Boston, are consulting engineers.

The Oldsmobile Co., Hartford, Conn., has purchased a site on Main street, Manchester, Conn., and will build a garage and service station.

Cleveland

CLEVELAND, July 3.

The Ford Motor Co., Detroit, placed orders during the week, for about $150,000 worth of equipment including a heavy duty engine lathe with 186-in. swing and an 86-ft. bed, five die sinking machines and two large vertical boring mills. It is reported that the Fisher Body Corporation and the Wilson Body Co., Detroit, will be in the market in about 30 days for considerable machinery, mostly wood-working, to equip extensions now under way.

Local dealers did a fair volume of business during the week, but practically all in single tools, orders coming from well scattered sources. The aggregate business placed by manufacturers and dealers during June showed an improvement over May. The Ohio Brass Co., Mansfield, Ohio, is purchasing four or five machines for its experimental engineering department. The Chapman Valve Mfg. Co., Indian Orchard, Mass., has placed an order with a Cleveland machinery manufacturer for two 24-in. turret lathes. Manufacturers of punching and shearing machinery report some improvement in orders. The demand for forging machinery

is still dull. The Cleveland Board of Education received bids to-day for about 30 metal and wood-working tools covered by a list issued about a month ago.

The Warner & Swasey Co., Cleveland, made a price advance averaging about 10 per cent effective July 1 on its smaller types of turret lathes. No other advances by local manufacturers are reported but with increasing costs some Cleveland machine tool builders state that they will have to mark up prices. There has been some stiffening of wages in Cleveland in the metal working field. Many workmen have gone to Detroit to work in the automobile plants and there is a scarcity of some kinds of skilled labor. Some local automobile plants have commenced to curtail production slightly and are not employing as many men as they were, but other industries are increasing their working forces.

The Broden & Dailey Construction Co., Cleveland, has been organized as a partnership by G. A. Broden and K. T. Dailey and will manufacture wire mill and cold rolling equipment. Mr. Broden was connected with the American Steel & Wire Co., for 15 years as construction engineer and later as assistant superintendent. Mr. Dailey was connected with the engineering department of the Cleveland Machine & Mfg. Co., for 13 years. The company is located in the Union Building, 1836 Euclid Avenue.

The Goldsmith Welding & Engine Co., Canton, Ohio, has recently been organized and will establish a plant at Harrisburgh Road and Sixteenth Street, N. E. It will manufacture welded steel storage tanks, racks and frames and conduct a jobbing department and repair works. V. J. Goldsmith is president and general manager.

The Rose Machine & Spring Co., Canton, Ohio, according to an announcement made by N. J. Rose, president and general manager, has purchased the entire equipment of the Advance Dairy & Machine Co., and will move the equipment of both plants to the building of the Belden Motor Car Co., half of which has been leased. The Rose company manufactures special machinery, dies, tools, fixtures, etc., and does general machine shop work.

The Hoskins Mfg. Co., Detroit, has taken an order from the American Radiator Co. for a 50-kw. furnace for annealing brass which will be installed at the Buffalo works of the Radiator company.

It is reported from Akron that the Telestyle Umbrella Co., Findlay, Ohio, will locate in a plant at Main Street and Buchtel Avenue, Akron. E. A. Ziesloft is president.

The Lewis Electric Co., Minerva, Ohio, has purchased the plant of the Effinger-Menegay Machine & Die Co., Canton, Ohio, and has moved the equipment of the latter company to Minerva.

The Mason Tire & Rubber Co., Kent, Ohio, has purchased the plant of the Owen Tire & Rubber Co., Bedford, Ohio, which went into bankruptcy come time ago. It will be placed in operation shortly.

Cincinnati

CINCINNATI, July 3.

Advances in prices of radial drilling machines ranging from 5 to 7½ per cent were announced, effective July 1, by practically all manufacturers of this type of tool. Increasing costs of production, including iron and steel castings, and the fact that higher wages are being paid to secure competent mechanics, is the reason given. Reports are current that manufacturers of lathes are contemplating similar increases, and one manufacturer has already notified his dealers that a 5 per cent advance would be effective on July 1.

The month of June was not quite up to that of May in the number of orders booked, but ran much ahead of any other month this year. There were no spectacular purchases, most of the orders running to one and two machines. There is, however, a good demand for special machinery for rapid production purposes, one manufacturer reporting the receipt of five machines from an automobile builder. A drilling machine maker booked an order for a multiple spindle machine costing in the vicinity of $13,000. Railroad business is expected to put the machine tool industry on a higher production basis in the near future. The Santa Fe has purchased practically all of its list, the Missouri, Kansas & Texas bought a number of tools, including six radial drills, and the New York Central has also bought several tools. Local dealers report a fair demand for small tools, and used machinery is fairly active.

A noticeable pick-up in the demand for agricultural implements is reported by manufacturers in this district. An Indiana malleable shop which supplies a number of makers with malleable castings is running to capacity and is making tentative plans to increase its output should the demand be sustained. Manufacturers of wood-working and road building machinery are running practically full time.

The Logan, Ohio, car repair shops of the Hocking Valley Railroad will reopen on July 5 after having been closed since last November. About 200 men will be employed.

An automobile hotel, with a capacity of 225 cars and a completely equipped repair shop, will be erected at 308 Walnut Street, Cincinnati, contract having been awarded to the Ferro-Concrete Construction Co. The building will cost approximately $225,000.

The Portsmouth Stove & Range Co., Portsmouth, Ohio, has let contract to the Ferro-Concrete Construction Co., Cincinnati, for an addition to its plant, to cost with equipment $100,000. It has placed an order with the George J. Hagen Co. for the ovens and other equipment.

The auction sale of the plant of the Barney & Smith Car Co., Dayton, Ohio, scheduled for June 28, has been postponed until Wednesday, July 12. It is reported that the bondholders protective committee will bid in the property.

The Marietta Paint & Color Co., Marietta, Ohio, will erect a building, 30 x 82 ft., on Dennison Avenue, Columbus, Ohio, and plans to install a number of storage tanks to take care of its business in that city.

Baltimore

BALTIMORE, July 3.

The New Brick & Tile Co., Moreland Building, Easton, Md., has been organized under State laws with a capital of $50,000 to manufacture hollow tile, etc. A site has been acquired and plans for the initial works are being completed. It will cost close to $45,000, including machinery. The company is headed by Robert L. Kemp, J. Elwood Smith and J. Fletcher Clark.

Motors, controllers, electrical and other equipment will be installed in the new printing plant to be erected by the Register & Bee Publishing Co., Danville, Va., estimated to cost about $80,000. R. A. Jones is president.

The Board of Harbor Commissioners, Wilmington, Del., is perfecting details of the equipment installation at the new marine terminal now in course of construction and which is expected to be ready for service early in 1923. The equipment will include gantry cranes, tractor trailers, locomotives, electric dock winches, etc., with fixed steel Burtoning spans. The storage yard will be provided with a locomotive crane. It will cost $3,410,000.

The Shippers' Compress Co., Atlanta, Ga., has leased a building on Stewart Avenue, and plans the immediate installation of machinery for a cotton compressing plant.

A one-story electric power plant will be constructed by the Ruby Cotton Mills, Inc., Gastonia, N. C., recently organized, in connection with its proposed mill. James A. Page, Clover, S. C., is president.

The Caldwell Power Co., Morganton, N. C., has acquired the plant and property of the Citizens' Light & Power Co., Lenoir, N. C., and has plans under way for extensions and improvements. A. M. Kistler heads the company.

Electric loading and unloading machinery, industrial trucks, conveying equipment, etc., will be installed at the proposed six-story municipal warehouse and pier to be constructed at Locust Point, by the Port Development Commission, Baltimore, Md., estimated to cost about $3,000,000. It will be leased to the W. P. Tanner-Gross Co., 25 Beaver Street, New York. Engineers of the latter company are working with the commission in the preparation of plans.

The Georgia Sand & Gravel Co., Augusta, Ga., recently organized, plans for the installation of screening, washing and other machinery at its plant to develop an output of 500 tons of material per day. E. W. Hancock is general manager.

The South Boston Mfg. Co., South Boston, Va., is planning for the installation of new machinery in its foundry and machine shop. J. L. Watkins is secretary.

The Textile Mill Supply Co., Charlotte, N. C., has filed plans for a new three-story and basement building, totaling about 30,000 sq. ft. of floor space. A machine shop will be installed.

A vocational department will be installed in the new high school to be constructed at Dover, Del., estimated to cost about $200,000.

E. T. Brown, Newmarket, Va., is completing the organization of a new company to construct and operate a hydro-electric power plant on the Pitts Run River.

A vocational department will be installed in the two-story high school to be erected at Western Port, Md., estimated to cost close to $100,000. Charles M. Anderson, 324 North Charles Street, Baltimore, Md., is architect.

A vocational department will be installed at the proposed high school to be constructed at Duke, N. C., by the Duke School District trustees, estimated to cost about $75,000.

An electric power plant will be installed by the White Co., Mebane, N. C., at its furniture factory, to replace present steam operation. Motors and electric-operating equipment will be installed in the different departments. W. E. White is president.

The Youghiogheny Water & Electric Co. and the Youghio-

gheny Power Co., Oakland, Md., affiliated companies, have made application for permission to construct and operate a hydroelectric generating plant on the Youghiogheny River, near Oakland.

The County Board of Education, Salisbury, Md., will install a vocational department in connection with its high school to be erected in the vicinity of Wicomico, estimated to cost approximately $300,000.

The Aerial Transport Corp., Richmond, Va., recently organized with a capital of $2,000,000, is planning for the establishment of a machine repair and construction plant in connection with its proposed aircraft transportation system. Edmund M. Preston is president.

The Columbus Electric & Power Co., Columbus, Ga., has arranged for a bond issue of $1,500,000, a portion of the proceeds to be used for extensions and improvements. C. F. W. Wetterer is president.

The Chief of the Supply Section, United States Veterans' Bureau, Washington, is taking bids until July 10, for one cylinder reboring tool, as specified in circular V-151-M.

Canada

TORONTO, July 3.

The demand for machine tools in this market has shown slow but gradual improvement the past week or two. Large buying, however, is still absent, but a steady call prevails for equipment in single units. Inquiries are also increasing in volume. At present wood-working equipment is furnishing the greater part of the current business, but a slight improvement is reported in equipment for foundries and automobile plants. Among a number of plants in Ontario general industrial activities are said to be increasing and buying for replacement purposes is more pronounced. The demand for small tools remains steady, but shows no improvement over last week.

The Consolidated Mining & Smelting Co. has announced that construction will start immediately on a 500-ton concentrator plant at Kimberley, B. C. It will represent an expenditure of upward of $1,250,000. It is expected to be completed and in operation early in 1923. A. Broderick, Trail, B. C., is architect.

The contract for additions and alterations to a building for the Empire Brass Foundry, 128 Wellington Street, Montreal, has been awarded to W. H. Madigan, 939 Atwater Avenue.

The general contract for an addition to the machine shop for the Canadian Aloxite Co., Montrose, Ont., has been awarded the Robertson Construction Co., Erie Avenue, Niagara Falls, Ont.

The Yarmouth Light & Power Co., Yarmouth, N. S., proposes to erect a hydroelectric power plant. G. St. C. Perrin is engineer.

The Pacific Coast

SAN FRANCISCO, June 29.

The Columbia Steel Co., 503 Market Street, San Francisco, has preliminary plans under way for an addition to its plant at Pittsburg, Cal. W. E. Creed is president.

The Pioneer Rubber Mills, Inc., 68 Sacramento Street, San Francisco, manufacturer of tires and other rubber products, has plans nearing completion for a new plant at Pittsburg, Cal., to cost about $100,000, including machinery. B. G. McDougall, 381 Bush Street, is architect.

The Oil Tool Service Mfg. Co., Anaheim, Cal., has plans in progress for a one-story machine shop and foundry at Santa Ana and Atchison streets. B. D. McAlvay and M. N. Putnam head the company.

A vocational department will be installed in the new high school to be erected at Santa Rosa, Cal., for which bonds totaling $375,000 have been approved. The Board of Education will select an architect to prepare plans.

The Board of Education, El Monte, Cal., has plans under way for a one-story vocational and manual training building at the union high school, 50 x 200 ft., and will call for bids about July 15. E. C. Thorne, 620 Western Mutual Building, Los Angeles, is architect.

The Little Rock Power & Water Co., 615 Chapman Building, Los Angeles, has made application for permission to construct and operate a hydroelectric power plant in Los Angeles County, with capacity of 2450 hp., estimated to cost about $350,000.

The Caladero Products Co., Atascadero, Cal., will commence the immediate erection of a new cold storage and refrigerating plant to cost about $200,000, including machinery.

The Marine Equipment Co., Aberdeen, Wash., has acquired property between Aberdeen and Hoquiam, and has plans under way for a new plant, estimated to cost about $275,000, including machinery.

The Pacific Power & Light Co., Portland, Ore., has selected a site near Hood River, Ore., for its new hydroelectric power plant and will soon commence active work on the initial unit, to have a capacity of about 7,500 hp.

The Commercial Iron Works, Portland, Ore., has filed plans for a one-story works at 360-74 Union Avenue, estimated to cost about $18,000, exclusive of equipment.

The Santa Fe Railroad Co., Kerckhoff Building, Los Angeles, is completing plans for a new reinforced-concrete power house at its shops at San Bernardino, Cal., to cost about $100,000.

The Boston-Idaho Gold Mining Co., Grimes Pass, near Boise, Ida., has preliminary plans under way for rebuilding its electric power house, recently destroyed by fire with loss estimated at close to $100,000.

The Idaho Sash & Door Co., Nampa, Ida., is contemplating the erection of a new plant to cost about $60,000.

Plans of New Companies

The Brunswick Refrigerating Co., New Brunswick, N. J., and the Kroeschell Brothers Ice Machine Co., Chicago, and the Kroeschell Brothers Co., Chicago, have combined as the Brunswick-Kroeschell Co., with main offices at New Brunswick, N. J. For the present, at least, both the New Brunswick and Chicago plants will remain in operation.

The Gable-Christal Co., Sumter, S. C., has recently been organized to manufacture all-metal boll weevil traps. The company has its own factory.

The United Radio Corporation of America, 1210 Michigan Avenue, Chicago, has engaged in the manufacture and wholesaling of radio equipment. All contracts have been awarded.

Clark's Iron Foundry has been incorporated to take over the plant and business of J. Alfred Clark, deceased, Philadelphia. The new organization will not be in the market for new equipment.

The Wilson "Reverso" Window Co., 168 Upper Michigan Avenue, Chicago, is equipping a factory at Elkhart, Ind., including a machine shop, for the manufacture of all types of No. 12 gage steel window frames and sash. The company will make a specialty of the Wilson "Reverso" window both in steel and bronze or extruded metal. President is Harrison D. Wilson; vice-president, Grover H. Ashbrook; treasurer, J. L. Kennedy.

The William Schmitt Co., 80 Twenty-second Street, Irvington, N. J., has taken over the business formerly conducted under the name of Herman Schmitt, and will continue the manufacture of carpenters' and woodworkers' tools in which the latter was engaged.

The Cranston Wire Binding Machine Co., Spokane, Wash., which was recently organized, has contracted with a Spokane manufacturing company to make its machines, and will not for the present undertake the construction and equipment of a plant of its own.

The Davis-Jones Insulated Wire Co., whose temporary offices are at 216 Main Street, Pawtucket, R. I., will manufacture national electrical code standard wires and cables, also flexible lamps and portable cords, including such items as heater cords, silk covered cords, armored cords for automobile lighting purposes and radio head set cords. The company has purchased land and buildings in Phillipsdale, R. I., and has purchased considerable machinery for its plant, which will be in operation about Aug. 15.

The Radio Appliance Mfg. Co., 6282 Beaubien Street, Detroit, manufacturer of radio equipment, was recently incorporated.

The Standard Welding Co., 665 South Water Street, Providence, R. I., Harry T. Prince, president, has outgrown its present manufacturing quarters and expects to build a new plant or addition within the near future. No definite plans have been made, however, for such expansion.

The American Nut Co., 343 Lenox Avenue, Detroit, has been incorporated with capital stock of $25,000 to manufacture bolts, nuts and screw machine products. Equipment has been purchased.

The Keystone Friction Hinge Co., Williamsport, Pa., has been incorporated by V. C. Luppert, who has conducted the business under his sole ownership for the past 15 years. The incorporation is for the purpose of taking in as partners some of the older employees of the business. The company manufactures furniture hardware.

The K. I. Willis Corporation, Moline, Ill., is the new corporate name for the manufacturing business which has been conducted in that city by the Willis & Sons Co. The company makes elevator cups, mill supplies and sheet iron specialties.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined iron bars, base price	2.58c.
Swedish bars, base price	7.00c.
Soft steel bars, base price	2.58c.
Hoops, base price	3.63c.
Bands, base price	3.23c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	2.68c.
Channels, angles and tees under 3 in. x ¼ in., base	2.58c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	2.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	2.80c.
Toe-calk, ½ x ⅜ in. and larger	3.40c.
Cold-rolled strip, soft and quarter hard	6.25c. to 7.25c.
Open-hearth spring steel	3.50c. to 6c.
Shafting and Screw Stock:	
Rounds	3.35c.
Squares, flats and hex	3.85c.
Standard cast steel, base price	12.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	2.68c.

Sheets

Blue Annealed	Per Lb.
No. 10	3.63c.
No. 12	3.68c.
No. 14	3.73c.
No. 16	3.83c.

Box Annealed—Black

	Soft Steel C. R., One Pass, Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	4.00c. to 4.30c.	.....
Nos. 22 and 24	4.05c. to 4.35c.	4.60c.
No. 26	4.10c. to 4.40c.	4.65c.
No. 28	4.20c. to 4.50c.	4.75c.
No. 30	4.45c. to 4.75c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher.

Galvanized

	Per Lb.
No. 14	4.30c. to 4.60c.
No. 16	4.45c. to 4.75c.
Nos. 18 and 20	4.60c. to 4.90c.
Nos. 22 and 24	4.75c. to 5.05c.
No. 26	4.90c. to 5.20c.
No. 27	5.05c. to 5.35c.
No. 28	5.20c. to 5.50c.
No. 30	5.70c. to 6.00c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt..	—56	—40	¾ in. Butt..	—30	—13
¾ in. Butt..	—61	—47	1½ in. Butt..	—32	—15
1-3 in. Butt..	—63	—49	2 in. Lap....	—27	—10
3½-6 in. Lap.	—60	—46	2½-6 in. Lap.	—30	—15
7-8 in. Lap..	—56	—34	7-12 in. Lap..	—23	— 7
9-12 in. Lap.	—55	—33			

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	3.50c. to 3.75c.
Annealed soft	3.50c. to 3.75c.
Galvanized annealed	4.25c. to 4.50c.
Coppered basic	4.00c. to 4.25c.
Tinned soft Bessemer	5.50c. to 5.75c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16¾c. to 17¼c.
High brass wire	17¼c. to 17¾c.
Brass rod	14¾c. to 15¾c.
Brass tube, brazed	23¾c. to 24½c.
Brass tube, seamless	20 c. to 20½c.
Copper tube, seamless	22¼c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20¾c. to 21¾c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14-20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	Primes	Wasters
			80 lb..	$6.05 $5.80
			90 lb..	6.15 5.90
			100 lb..	6.25 6.00
IC..	$10.00	$8.50	IC..	6.40 6.15
IX..	11.50	10.00	IX..	7.40 7.15
IXX..	13.00	11.25	IXX..	8.40 8.15
IXXX..	14.25	12.50	IXXX..	9.40 9.15
IXXXX..	16.00	14.00	IXXXX..	10.40 10.15

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00
IC	7.25
IX	7.50
Fire door stock	9.00

Tin

Straits, pig	33½c.
Bar	40c. to 44c.

Copper

Lake ingot	15¼c.
Electrolytic	15 c.
Casting	14¾c.

Spelter and Sheet Zinc

Western spelter	6¾c. to 7c.
Sheet zinc, No. 9 base, casks	8½c. open 9c.

Lead and Solder*

American pig lead	6¾c. to 7c.
Bar lead	8c. to 8½c.
Solder, ½ and ½ guaranteed	25c.
No. 1 solder	23½c.
Refined solder	20¼c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c.
Commercial grade, per lb.	35c.
Grade D, per lb	25c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	25c. to 27c.

Old Metals

The market continues firm but has been quiet this week. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.75
Copper, heavy wire	11.25
Copper, light and bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	8.50
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	7.75
Lead, heavy	4.50
Lead, tea	3.25
Zinc	2.75